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# INTERNATIONAL RAILWAY CONGRESS ASSOCIATION

ENLARGED MEETING OF THE PERMANENT COMMISSION
(LISBON, 1949.)

## QUESTION I.

a) **Mechanisation of the maintenance and renewal of the permanent way.**

b) **Recent improvements relating to reinforced concrete and prestressed concrete sleepers. Results obtained.**

c) **Recovery and strengthening of metal bridges that have reached the theoretical limit of safety.**

## REPORT

*(America, Great Britain, Dominions, Protectorates and Colonies, China, Egypt and India.)*

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# a) Mechanisation of the maintenance and renewal of the permanent way

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### 1. Scope of report.

This report is concerned only with the maintenance and renewal of the permanent way (rails, sleepers and fastenings), ballast cleaning and the stabilisation of the formation (roadbed). Seasonal tasks such as weed-killing, snow clearing and anti-frost precautions are not discussed. The purpose of this report is to summarize and compare the extent to which mechanical equipment is used within these limits by railways in America, Great Britain, Dominions, Protectorates and Colonies, China, Egypt and India, and to describe briefly such equipment and its method of use. Mechanical tools used solely in workshops or depots are not within the scope of this report, nor is mention made of small tools such as jacks, rail benders, ratchet drills, hand saws, etc., which have been used for many years by all railways and are consequently well known.

### 2. Source of information.

In June 1948 an agreed questionnaire was sent to thirty Railway Organisations in the countries listed above. Seventeen railways replied and a list is given in Table I, together with the track-mileage maintained by each.

The six Regions of the now nationalised British Railways have been considered as separate Railway Organisations for the purpose of this report because, except for the Scottish and North Eastern Regions, the Regional

## TABLE I

### RAILWAYS REPLYING TO QUESTIONNAIRE AND TRACK-MILEAGE MAINTAINED

*CLASS A* — Lines on which speeds are 60 m.p.h. or over or which carry trains weighing more than 1 000 tons.

*CLASS B* — Lines on which speeds are 40 to 60 m.p.h. or which carry trains weighing more than 500 tons.

*CLASS C* — Other running lines not included in Classes *A* or *B*.

*CLASS D* — Sidings (i. e. not running lines).

| RAILWAY | Non-electrified lines | | | | Electrified lines | | | | Total track mileage |
|---|---|---|---|---|---|---|---|---|---|
| | Class A | Class B | Class C | Class D | Class A | Class B | Class C | Class D | |
| Ceylon Govt. Railway . | — | 255 | 760 | 145 | — | — | — | — | 1 160 |
| Iraqi State Railway. . . | — | — | 1006 | 80 | — | — | — | — | 1 086 |
| Costa Rica Railway . . | — | — | 248 | 80 | — | — | — | — | 328 |
| Sudan Railways . . . . | — | 2025 | — | 272 | — | — | — | — | 2 297 |
| Indian Railways . . . . | 11965 | 12346 | 6560 | 11120 | 491 | 77 | — | 164 | 52 723 |
| East African Railways. . | — | 1625 | 243 | — | — | — | — | — | 1 868 |
| South African Railways. | 5508 | 5267 | 1861 | 2234 | 1199 | — | — | — | 16 069 |
| Victorian Government Railway, Australia . . . | 1091 | 2634 | 1105 | 1083 | — | 241 | 10 | — | 6 119 |
| Bessemer and Lake Erie Railroad. . . . . . . . | 337 | — | — | 205 | — | — | — | — | 542 |
| Pensylvania and Long Island Railroad . . . . | 5218 | 3334 | 4365 | 9032 | 1339 | 476 | 315 | 540 | 24 619 |
| London Transport Executive . . . . . . . . . | 40 | 4 | 4 | 21 | 30 | 187 | 180 | 141 | 607 |
| British Railways, Scottish Region . | 2496 | 1707 | 1182 | 2025 | — | — | — | — | 7 410 |
| —do— Eastern Region . | 2818 | 2287 | 829 | 2541 | — | — | — | — | 8 475 |
| —do— Western Region . | 4156 | 1542 | 910 | 2680 | — | 21 | — | — | 9 309 |
| —do— N. Eastern Region | 1386 | 600 | 1501 | 1817 | — | 88 | 4 | 5 | 5 401 |
| —do— London Midland Region . . . . . | 3710 | 4650 | 1750 | 4804 | 290 | — | — | 33 | 15 237 |
| —do— Southern Region . | 1727 | 462 | 415 | 1307 | 1328 | 354 | — | 89 | 5 682 |

Areas are much the same as for the previous separate Railway Companies (Great Western Railway, London Midland & Scottish Railway, London & North Eastern Railway, and Southern Railway) and nationalisation is too recent an event for maintenance practice to have become standardised.

Only two railways in the U. S. A. replied to the questionnaire but considerable information has been supplied by the American Railway Engineering Association on the general practice throughout the States. Further information has been obtained from the monthly periodical *Railway Engineering and Maintenance*.

It has not been found possible to obtain detailed information from China and Pakistan, nor have details been provided by the Canadian Railways but, broadly speaking, it may be said that the latter follow the practice in the U. S. A.

### 3. Organisation of mechanised labour forces.

It is only in the U. S. A. and Great Britain that the use of mechanical equipment is sufficiently far advanced to have caused a re-organisation of labour forces. While other countries do employ such equipment to a limited extent, its use is by no means general practice and at the moment they are in a transition stage. Railways in the U. S. A. and Great Britain are constantly seeking means of reducing maintenance costs and because of the high cost and scarcity of labour, this has largely been achieved by the use of mechanical equipment. In the U. S. A. the cost of labour is relatively higher, competition from road transport is more serious and the distances between towns greater than in most other countries and all these difficulties are likely to be best overcome by mechanisation. It is not surprising, therefore, that far greater use is made of mechanical equipment in the U. S. A. than elsewhere.

It is interesting to compare the different methods employed of organising mechanised labour forces in the U. S. A. and Great Britain.

In the U. S. A. the tendency is to employ large, highly specialised gangs equipped with varying amounts and types of mechanised tools and performing such work as tamping, re-ballasting, rail grinding, building up battered rail ends by welding, ballast cleaning, re-railing, re-sleepering, hardening rail ends and re-conditioning fishplates in the track. Each gang performs only one of these tasks and thus becomes highly skilled in its particular sphere and so obtains the maximum possible output per man-hour. They are employed on the System wherever they may be needed and work over the longest possible length of track in each locality. It has not been found economical to equip length or local gangs with mechanical equipment, as its occasional use by these gangs does not warrant the necessary expenditure. Thus the work of local length gangs has on many railways been reduced to patrolling and essential minor day to day repairs.

The mobility of special gangs is ensured by the provision of special trains as living quarters for large gangs and the increasing use of road transport for smaller gangs. The use of the latter also reduces the time lost in transporting men to work caused by delays to trolley trains, particularly in areas where the traffic is dense, or where inclement weather tends to cause delay.

It is, as yet, too soon to say definitely what will be the future practice in Great Britain, but that apparently evolving is to increase the length maintained by local gangs in outlying districts and on less important lines and to provide them with power-operated tools and motor trollies in order to make this pos-

sible without increasing the strength of the gang. Road lorries are also used in outlying districts. These gangs are responsible for maintaining the track to correct line and level, ballast cleaning and the maintenance of fences and verges to such a degree as to make the employment of special gangs unnecessary except for such jobs as track renewals, building up battered rail ends by welding and stabilisation of the formation.

When such special gangs are employed, mechanical equipment is used where possible and trains are provided as living quarters in outlying districts, particularly in Scotland.

Increasing use is made of hand-operated mechanical appliances by length gangs in order to reduce the amount of manual labour. Amongst these may be mentioned rail-creep adjusters, measured shovel packing, sighting boards for track levelling and track-liners.

The Eastern Region of the British Railways formed a trial mechanised gang in January, 1948, equipped with the following tools :—

One Ingersoll-Rand air compressor.
One motor trolley and trailer.
Two Abtus ballast riddlers.
One Allen motor scythe.
One Dashwood motor hoe.
One rail-creep adjuster (hand operated).
Four Abtus track liners » »
Two fence post drivers » »
Two fence post extractors » »

This gang of 14 men maintains 3 ¼ geographical miles of four-line track but as yet it is not possible to compare the cost of their work with other gangs.

The methods used for renewing the track also differ.

In the U. S. A. the special relaying gangs employ much the same procedure as was previously adopted by heavy gangs relaying track by hand except that portable power-operated tools are now used for each operation (e.g. spike pulling and driving, sleeper adzing, rail drilling, etc.) whereas in Great Britain it is a growing practice to assemble the track in convenient lengths at permanent-way depots and to use special mechanical equipment for removing the old track in similar lengths before relaying the new. Thus the extensive use of power-operated tools on the site is unnecessary. Further details of relaying methods are given later in this report.

In an attempt to compare the extent of mechanisation in the U. S. A., Great Britain and Australia, the numbers of various types of machines owned by four railways are given in Table II. These railways are the Pennsylvania Railroad, Bessemer and Lake Erie Railroad, British Railways and the Victorian Government Railway. None of the other railways replying to the questionnaire use power tools to any great extent. It must be remembered however, when examining this Table, that power tools used exclusively in workshops and depots, or for bridge and building work, are not included, nor are the tools mentioned necessarily used exclusively for the maintenance of permanent way.

### 4. Types of machines.

Various types of machines may be used for the many operations in the maintenance and renewal of the permanent way and it is quite impossible to generalise as each railway has its own particular conditions to consider when selecting the type of machine to use.

One of the most important factors is, of course, the extent to which possession of the track may be obtained by arrangement with the Operating Department concerned. When the nature of the job makes such possession unavoidable (e.g. track renewal) then it is possible to use large on-track machines, but

## TABLE II

## APPROXIMATE NUMBER OF POWER TOOLS OWNED BY VARIOUS RAILWAYS

<table>
<tr><th rowspan="2">MACHINE</th><th rowspan="2">HOW DRIVEN</th><th colspan="2">Pensylvania Railroad (14 455 track-miles) ø</th><th colspan="2">Bessemer & Lake Erie Railroad (337 track-miles) ø</th><th colspan="2">British Railways (36 621 track-miles) ø</th><th colspan="2">Victorian Government Railway, Australia (5 036 track-miles) ø</th></tr>
<tr><th>No.</th><th>Year first used</th><th>No.</th><th>Year first used</th><th>No.</th><th>Year first used</th><th>No.</th><th>Year first used</th></tr>
<tr><td>Track wrench</td><td>Petrol engine . .<br>Compressed air .</td><td>127<br>—</td><td>1934<br>—</td><td>3<br>—</td><td>1936<br>—</td><td>Trial<br>Trial</td><td>—<br>—</td><td>Trial<br>—</td><td>1946<br>—</td></tr>
<tr><td>Rail saw</td><td>Petrol engine . .</td><td>21</td><td>1936</td><td>3</td><td>1937</td><td>× 140</td><td>1927</td><td>2</td><td>1933</td></tr>
<tr><td>Rail drill</td><td>Petrol engine . .<br>Electricity . . .</td><td>85<br>—</td><td>1933<br>—</td><td>2<br>—</td><td>1937<br>—</td><td>× 140<br>200</td><td>—<br>—</td><td>Trial<br>—</td><td>1947<br>—</td></tr>
<tr><td>Rail grinder</td><td>Petrol engine . .<br>Electricity . . .</td><td>217<br>—</td><td>1928<br>—</td><td>2<br>—</td><td>1938<br>—</td><td>7<br>22</td><td>1937<br>—</td><td>1<br>—</td><td>1932<br>—</td></tr>
<tr><td>Spike puller</td><td>Petrol engine . .</td><td>39</td><td>1930</td><td>2</td><td>1945</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>Spike driver</td><td>Compressed air .<br>Petrol Engine . .</td><td>Not<br>—</td><td>given<br>—</td><td>6<br>Trial</td><td>1940<br>1947</td><td>Trial<br>—</td><td>—<br>—</td><td>6<br>—</td><td>1946<br>—</td></tr>
<tr><td>Chair screw wrench</td><td>Petrol engine . .<br>Electricity . . .</td><td>—<br>—</td><td>—<br>—</td><td>—<br>—</td><td>—<br>—</td><td>× 140<br>24</td><td>—<br>1929</td><td>—<br>—</td><td>—<br>—</td></tr>
<tr><td>Sleeper auger</td><td>Petrol engine . .<br>Compressed air .<br>Electricity . . .</td><td>49<br>—<br>—</td><td>1938<br>—<br>—</td><td>5<br>—<br>—</td><td>1936<br>—<br>—</td><td>× 140<br>—<br>◆ 30</td><td>—<br>—<br>1929</td><td>—<br>33<br>—</td><td>—<br>1945<br>—</td></tr>
<tr><td>Sleeper adzer</td><td>Petrol engine . .</td><td>58</td><td>1930</td><td>3</td><td>1938</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>Jacking machine</td><td>Petrol engine . .</td><td>29</td><td>1930</td><td>3</td><td>1939</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>Hand tamper</td><td>Compressed air .<br>Electricity . . .</td><td>●<br>—</td><td>—<br>—</td><td>50<br>—</td><td>1931<br>—</td><td>Trial<br>Trial</td><td>1947<br>1947</td><td>24<br>—</td><td>—<br>—</td></tr>
<tr><td>Self-contained unit temper</td><td>Internal combustion . . . . .</td><td>350</td><td>—</td><td>20</td><td>1937</td><td>80</td><td>1939</td><td>8</td><td>—</td></tr>
<tr><td>On-track tamping machine</td><td>Petrol engine . .<br>Electricity . . .</td><td>21<br>—</td><td>—<br>—</td><td>—<br>—</td><td>—<br>—</td><td>1<br>1</td><td>1947<br>1932</td><td>—<br>—</td><td>—<br>—</td></tr>
<tr><td>On-track ballast cleaner</td><td>Petrol engine . .</td><td>3</td><td>1928</td><td>—</td><td>—</td><td>Trial</td><td>1947</td><td>—</td><td>—</td></tr>
<tr><td>Off-track ballast cleaner</td><td>Petrol engine . .</td><td>53</td><td>1933</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>Ballast riddler</td><td>Petrol engine . .</td><td>—</td><td>—</td><td>—</td><td>—</td><td>46</td><td>—</td><td>Trial</td><td>1948</td></tr>
</table>

ø Excluding sidings (See Table I).

× This is approximate number of portable petrol engines which, with appropriate frames, may be used as a rail saw, rail drill, chair screw wrench or sleeper auger.

● Approx. 150 compressors which may be used with an unspecified number of tools.

◆ In addition the Western Region has recently purchased 23 portable generators for operating an unspecified number of tools.

these machines may also be required to work in between trains and therefore they are more often than not equipped with a traversing carriage enabling them to be easily removed from the track at selected run-off points. On the other hand, the construction of an on-track machine may be unnecessarily costly and its self-propulsion, which is usually a distinct advantage, may not always be a desirable feature. Therefore light machines which can be easily lifted from the track by 2 or 3 men are frequently used. Particularly is this true of tools such as bolt wrenches, rail drills, rail grinders, sleeper augers, etc. For other operations it is impossible to avoid a heavy on-track machine and the use of massive, highly powered machines has, in some cases, produced far greater economy in labour and costs than smaller machines.

The problem of working in between trains may be overcome by the use of portable tools driven from an air-compressor or electric-generator placed off-track and several railways use this type. In the U. S. A. advantage is taken of wide side clearances and verges when using this type and the compressor or generator is mounted on a tractor to provide greater mobility. In Great Britain the narrow verges and tighter clearances prevent such a practice and it is only possible to use portable generators moved along by four men and the number of tools that can be operated is consequently limited. Where conditions allow and possession of the track can be obtained, generators and compressors are mounted on wagons or specially constructed rail-cars.

For some operations it is found that to construct specially designed machines is an unnecessary expense and mechanical equipment already owned by the railway is used with or without minor alterations. Mention may be made of tractors fitted with side booms for rail laying, etc., and crawler cranes mounted on flat rail-cars to provide an on-track crane.

The subject of on-track versus off-track machines is a controversial one and in any case must be decided by conditions existing on each railway. In many cases a particular type of machine may be prohibited by these conditions. Questions asked on this subject have produced a variety of replies. Some railways prefer portable petrol-driven machines because of their smaller capital cost and ease of removal from the track. Others have found that powerful on-track machines are most suitable, while in some cases the use of such machines is prohibited by restricted loading gauge. Indication is given that portable petrol-driven machines are found to be less reliable than tools driven from a compressor or generator but when the latter cannot be supported in some way, they are often tiring to operate. The London Transport Executive have a special problem in that trains run every few minutes and only very short possessions are possible and therefore on-track machines are not convenient and even portable petrol-driven machines are found to be too heavy for the operator to lift from the track every few minutes. Work in the tunnels and tubes of London presents difficulties in operating petrol-driven portable machines, compressors and generators and long air lines or electric cables are generally considered unpractical.

One railway considers petrol-driven machines to be most adaptable while another prefers electric machines and yet a third is of the opinion that on-track machines are more flexible. There is no agreement on the comparative dependability of machines driven by petrol-engine, compressed air and electricity, though in many cases compressed air is preferred for hammer tools and electricity or petrol-engine for rotary tools while machines involving

lifting devices are generally hydraulically operated.

The question of the design and maintenance of mechanical equipment is not considered in this report but it obviously has an important bearing on the subject.

A list of various types of machines is given in Table III together with the countries in which they are used. This list is not comprehensive but indicates the types of machines which may be used for several operations in the maintenance and renewal of permanent way.

### 5. Reductions in expenditure and labour force achieved by mechanisation.

Few of the railways replying to the questionnaire use mechanical equipment to the full extent possible and those that do either have no figures available showing reductions in maintenance costs as a result of the use of mechanical plant, or the information has been given in widely differing forms which cannot be used for comparative analysis. However, this is one of the most important aspects of mechanisation and where possible some indication of savings achieved has been given throughout this report. Table IV states the estimated man-hours that would be required to perform by hand the work done by various machines as reported by the Pennsylvania Railroad Company. In Table V figures are quoted from a report published by the American Railway Engineering Association in 1940 showing the reductions in maintenance costs achieved with varying labour rates. As stated in this report, where a fixed sum is allotted for maintenance work, subsequent increases in labour rates reduce the amount of man-hours that can be utilised and the maintenance programme can then only be completed by the use of mechanical plant and obviously only such plant can be used which is capable of displacing labour as well as reducing expenditure. A Committee was therefore formed « ... for the purpose of exploring the possible extent of further mechanisation, measuring the increasing economic justification of such mechanisation at increasing hourly earnings... » To quote further, « The Statements included (in the Committee's report) show comparable hand and machine organisation, annual costs based on hourly labour rates varying from 30 cents to 40 cents per hour, and both force and expenditure curtailments resulting from mechanisation ». The report of this Committee was published in the A.R.E.A. Bulletin, No. 419, dated September-October, 1940. The detailed analysis made by the Committee in order to arrive at the results quoted in Table V has not been included nor has it been found practical to relate these figures to savings in expenditure reported by other countries.

### 6. Operations performed with mechanical equipment.

(a) *Track slueing.*

Power-operated track sluers are only used in the U. S. A. The only machine for which details are provided is the Nordberg Track Shifter, operated by a 40 horse-power petrol engine.

Hand-operated track sluers are used in Great Britain and Australia.

(b) *Rail turning.*

Side-worn rails are changed from one side of the track to the other by five railways and changed end for end by one railway. Two other railways use both methods. Several railways report the use of cranes for this purpose where circumstances permit and it is understood that in the U.S.A. extensive use is made of on-track and crawler cranes for this purpose. The Western Region

TABLE III

TYPES OF MACHINES AND COUNTRIES IN WHICH THEY ARE USED.

| Operation | | How driven | Description | Countries where used | Countries where on trial |
|---|---|---|---|---|---|
| Loosening and tightening fishplate bolts | 1. | Petrol engine | On-track. Portable. | U. S. A. | Australia |
| | 2. | Compressed air | Hand tool. Off-track compressor. | | Great Britain |
| Rail cutting. | 1. | Petrol engine | On-track. Portable. | U. S. A.<br>Australia | |
| | 2. | Petrol engine | × Hand operated. Portable. Self-contained unit. | Great Britain | |
| Rail drilling. | 1. | Petrol engine | On-track. Portable | U. S. A. | Australia |
| | 2. | Petrol engine | × Hand operated. Portable. Self-contained unit. | Great Britain | |
| | 3. | Petrol engine | Hand tool. Flexible drive. Motor on-track or off-track. | U. S. A. | |
| | 4. | Electricity | Hand tool. Off-track portable generator. | Great Britain | |
| | 5. | Electricity | Hand tool. Driven by traction current. | Great Britain | |
| Rail grinding | 1. | Petrol engine | On-track. Portable. | U. S. A.<br>Great Britain | |
| | 2. | Petrol engine | Hand tool. Flexible drive. Motor on-track or off-track | U. S. A.<br>Great Britain | |
| | 3. | Compressed air | Hand tool. Off-track compressor. | U. S. A.<br>Australia | |
| | 4. | Electricity | Hand tool. Flexible drive from off-track electric motor. | Great Britain | |
| | 5. | Petrol engine | On-track. Traversing. | South Africa | |
| | 6. | Compressed air | On-track. Not removable. Propelled by loco. | East Africa | |
| | 7. | Electricity | Hand tool. Driven by traction current. | Great Britain | |
| Loosening and tightening. Chair screws and bolts. | 1. | Petrol engine | × Hand operated. Portable. Self-contained unit. | Great Britain | |
| | 2. | Electricity | Hand tool. Off-track portable generator. | — | Great Britain |
| | 3. | Compressed air | Hand tool. Off-track compressor. | Great Britain | |
| Spike pulling. | 1. | Petrol engine | On-track. Portable. | U. S. A. | |
| Spike driving. | 1. | Compressed air | Hand tool. Off-track compressor. | U. S. A.<br>Australia | Great Britain |
| | 2. | Compressed air | Hand tool. On-track compressor. | U. S. A. | |
| | 3. | Petrol engine | On-track. Portable. | U. S. A. | |

TABLE III (Continued).

| Operation | | How driven | Description | Countries where used | Countries where on trial |
|---|---|---|---|---|---|
| Sleeper augering. | 1. | Petrol engine | On-track. Portable. | U. S. A. | |
| | 2. | Petrol engine | Hand tool. Flexible drive from on-track or off-track motor. | U. S. A. | |
| | 3. | Petrol engine | × Hand operated. Portable. Self-contained unit. | Great Britain | |
| | 4. | Compressed air | Hand tool. Off-track compressor. | Australia | |
| | 5. | Electricity | Hand tool. Off-track portable generator. | Great Britain | |
| Sleeper adzing. | 1. | Petrol engine | On-track. Portable. | U. S. A. | |
| Sleeper cutting. | 1. | Petrol engine | On-track. Portable. | U. S. A. | |
| Track jacking. | 1. | Petrol engine | On-track. Portable. | U. S. A. | |
| Track slueing. | 1. | Petrol engine | On-track. Traversing. Self-propelled. | U. S. A. | |
| Tamping. | 1. | Compressed air | Hand tool. Off-track compressor. | U. S. A.<br>Great Britain<br>Australia | |
| | 2. | Compressed air | Hand tool. On-track compressor. | U. S. A. | |
| | 3. | Electricity | Hand tool. Off-track compressor. | U. S. A. | Great Britain |
| | 4. | Internal comb. | Hand operated. Portable. Self-contained unit. | U. S. A.<br>Great Britain<br>Australia | |
| | 5. | Petrol engine | On-track. Traversing. Self-propelled. | U. S. A.<br>Great Britain | |
| | 6. | Electricity | On-track. Traversing. | U. S. A.<br>Great Britain | |
| Ballast cleaning. | 1. | Petrol engine | Off-track. Cleans shoulder and inter-track. | U. S. A. | |
| | 2. | Diesel-electric | On-track. Not removable. Self-propelled (Cleans shoulder and inter-track.). | U. S. A. | |
| | 3. | Diesel-electric | On-track. Not removable. Propelled by loco. (Cleans shoulder and inter-track.) | U. S. A. | |
| | 4. | Diesel-electric | On-track. Traversing. Self-propelled. (Cleans underneath sleepers.) | — | Great Britain |
| | 5. | Petrol engine | Off-track. Portable. (Screens only.) | Great Britain | Australia |
| | 6. | Petrol engine | On-track. Traversing. (Cleans cribs only.) | U. S. A. | |

NOTES : 1. A machine referred to as « portable » is one which can be lifted by four men or less.

2. An on-track machine referred to as « traversing » is one which can be removed from the track sideways at selected run-off points.

3. Machines marked thus × are portable petrol engines which can be used for a number of operations when fitted with the appropriate frame and accessories.

of the British Railways have recently designed a « rail-barrow » to facilitate the changing of rails from one side of the track to the other. This consists of a one-wheeled hand trolley from which the rail is suspended during transfer from one side of the track to the other.

TABLE IV

PENNSYLVANIA RAILROAD, U. S. A.

**Equivalent man-hours required to do work of power tools.**

| Power tool | Estimated man-hours required per annum to perform by hand the work done by one power tool |
|---|---|
| Track-wrench | 6 600 |
| Rail saw | 1 200 |
| Rail drill | 1 800 |
| Rail grinder | 6 000 |
| Spike puller | 11 200 |
| Sleeper auger | 9 000 |
| Sleeper adzer | 12 850 |
| On-track power ballaster | 171 520 |
| Portable self-contained unit tamper | 250 |
| Power jack | 19 200 |

One railway, carrying frequent electric services reports 80 % increase in the life of rails by adopting this practice, while others report from 10 to 30 % increase in life.

(c) *Hardening rail ends in the track.*

This is done in the U. S. A. by heat treatment, using special on-track equipment, the work usually being let to contract (fig. 1). No details are provided except by the Bessemer and Lake Erie Railroad Company, where the work is done by a contractor using electric induction heaters. The general practice of hardening rail-ends in the track appears to be worthy of serious consideration for future adoption, but no other railway reports its use although the South African Railways are contemplating trials.

(d) *Re-conditioning fishplates in the track.*

This is done by heat treatment in the U. S. A., using special on-track equipment. The work is usually let to contract but the adoption of this practice is by no means general in that country. No costs are available.

(e) *Stabilisation of formation.*

The use of various types of mechanical plant has made the stabilisation of the formation an economic proposition and considerable saving in maintenance costs are reported. However, the practice is only widely used in Great Britain and the U. S. A.

It is the general practice on the Southern Region and to a lesser extent on the London Midland Region of the British Railways to remove the track completely (where possible in 60 foot lengths by means of a steam crane) and to excavate the unstable material with a crowd-shovel, skimmer or drag-line and bull-dozer. Various methods have been tried for forming the new bed, amongst which are : (*a*) standard permanent-way ballast with mesh reinforcement grouted with sand-cement grout, (*b*) a thin carpet formed with a mixture of quarry dust and bituminous

T

CURTAILMENT OF EXPENDITURE AND LAB

(Re-printed from Bulletin, No. 419, dated September-O

| Plant | Outfit | Total cost of outfit $ | Working period per annum | Work performed by one ou as basis for calculation |
|---|---|---|---|---|
| Portable power track-nutters. . . | 2 machines | 1 685 | 160 days (8 months) | Changing 200 pairs of splices day . . . . . . . . . . . |
| Rail power drill . . . . . . . . | 1 machine | 632 | 60 days (3 months) | 60 holes per day, 3 600 holes year. . . . . . . . . . |
| Burro rail crane . . . . . . . . | 1 crane with 3/8 yd. bucket | 8 023 | 180 days (9 months) | Miscellaneous . . . . . . |
| Air mechanical tamping outfit . . | | 7 269 | 190 days (9 months) | Out-of-face tamping — 700 per day, 25 miles per year |
| Portable gasoline unit tampers . . | 4 units | 1 188 | 180 days (9 months) | Spot tamping at frogs & switc station platforms, etc. . . |
| Scarifier and ballast leveller . . . | 1 machine | 8 097 | 85 days (4 months) | Ploughing ballast shoulder & ter-track for drainage . . |
| Power jack and power tamper . . | 4 power jacks 2 power tampers | 21 100 | 160 days (8 months) | Re-ballasting — 1/3 mile day, 53 miles per year . |
| Re-railing outfit . . . . . . . . . | See below | 34 273 | 160 days | 300-39 ft. rails — 228 tons per |

Re-r

3 spike pullers (1 spare)

5 portable track-nutters (1 spa

5 tie adzers (1 spare)

1 Burro rail crane

1 compressor (210 cu. ft.)

E BY POWER OPERATED EQUIPMENT

f the American Railway Engineering Association)

| al operating cost using e outfit at labour rates per hour of :— | | | Total operating cost by hand at labour rates per hour of :— | | | Curtailment of expenditure at labour rates per hour of :— | | | Number of men displaced |
|---|---|---|---|---|---|---|---|---|---|
| c. | 35 c. | 40 c. | 30 c. | 35 c. | 40 c. | 30 c. | 35 c. | 40 c. | |
| | $ | $ | $ | $ | $ | $ | $ | $ | |
| 25 | 9 640 | 10 454 | 9 453 | 10 810 | 12 167 | 628 | 1 170 | 1 713 | 6 |
| 30 | 755 | 780 | 920 | 1 047 | 1 175 | 190 | 292 | 395 | 3 |
| 52 | 4 028 | 4 104 | 7 085 | 8 000 | 8 916 | 3 133 | 3 972 | 4 812 | 11 |
| 41 | 4 941 | 5 441 | 5 627 | 6 373 | 7 119 | 1 186 | 1 432 | 1 678 | 3 |
| 27 | 4 909 | 5 290 | 4 714 | 5 248 | 5 783 | 187 | 339 | 493 | 2 |
| 13 | 3 949 | 3 985 | 22 086 | 25 294 | 28 501 | 18 173 | 21 345 | 24 516 | 90 |
| 69 | 100 042 | 108 115 | 129 213 | 144 952 | 160 691 | 37 244 | 44 910 | 52 576 | 106 |
| 88 | 125 700 | 134 112 | 153 704 | 167 612 | 181 519 | 36 416 | 41 912 | 47 407 | 80 |

ir spike drivers (2 spare)
ower bonding machines (1 spare)
ower rail drill
xy-acetylene outfit
ower grinder

emulsion, and (*c*) pre-cast concrete slabs laid on quarry dust (fig. 2), but the standard practice now adopted is to excavate up to a maximum of 5′0″ below rail level (the actual depth being determined by the application of « soil-mechanics » methods) and to refill with quarry dust consolidated by « frog-rammers » or vibrating rollers. Twelve inches of standard track ballast is provided on top of the quarry dust.

may be placed either by direct pressure from pumps or by air pressure and the mechanical equipment used varies considerably with the location and nature of the work.

Other methods of stabilisation reported from the U. S. A. are :—

(*a*) Driving poles or old rails 8 to 12 feet long spaced 18 to 21 inches apart at the ends of sleepers in cuts and light fills. On-track pile drivers working in

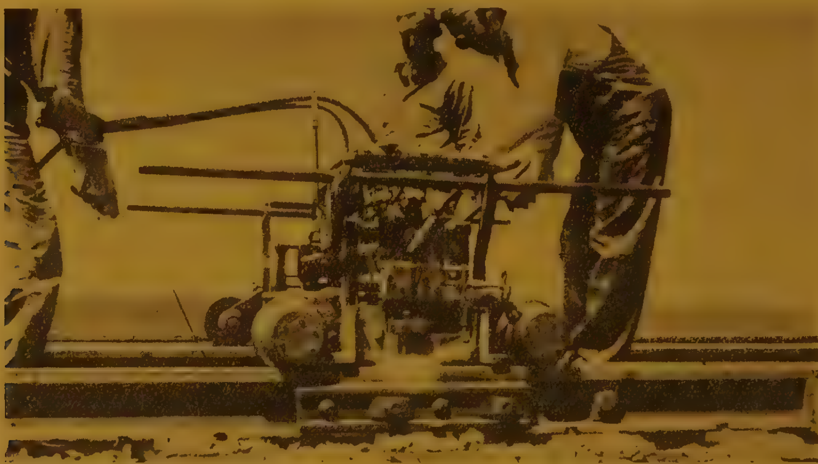


Fig. 1. — Hardening rail ends. U. S. A.

pairs are used for this work. One railway has dealt with 326 miles of track in this fashion over a period of years and reports a saving per annum of some 30 % of the cost of the work.

Pre-cast concrete mats have also been laid in the U. S. A. and the subsequent saving in maintenance costs per annum is reported to be some 30 % of the cost of the work.

Cement grouting, with or without bituminous emulsions, has been used extensively in the U. S. A. for many years and also by the Western Region of the British Railways during the last two years. Satisfactory results have been obtained and savings varying from 30 to 80 % per annum of the cost of the work according to the location are reported from the U. S. A. The grout

(*b*) Driving poles or old rails varying in length from 8 to 40 feet and spaced 3 to 5 feet apart on embankments and connected together by cross-ties placed through the embankment. One railway has dealt with 20 miles of track in this fashion and reports a saving per annum of 27 % of the cost of the work.

(*c*) Driving and withdrawing spuds, the holes being filled with sand. Steam-

operated on-track equipment has been used for this purpose.

(*d*) Placing of timber mats.

(f) *Tamping.*

Machines used at the present time may be divided into three types :—

(*a*) Portable units operated by an internal combustion engine, the whole unit being self-contained (fig. 3).

Fig. 2. — Laying precast concrete slabs. British Railways.

(*b*) Portable units operated by an air compressor or electric generator.

(*c*) Track-mounted units in which the tamping bars may be vibrated electrically or mechanically or attached to a heavy cross-head which is raised by power and allowed to fall under its own weight.

Types (*a*) and (*b*) are used in the U. S. A., Great Britain and Australia. Type (*c*) is used mainly in the U. S. A., but the British Railways possess three on-track machines and have ordered more.

In the U. S. A. extensive use is made of a variety of tamping machines for spot-surfacing, « out-of-face » tamping, and after re-ballasting or re-railing. Pneumatic and portable self-contained tampers are used for normal spot-surfacing and particularly at switches and crossings where the advantages of machine tamping over hand methods are particularly noticeable. It is, of course, impossible to use on-track machines at switches and crossings. For « out of face » tamping, and tamping after re-ballasting or re-railing where long lengths of track are involved the types most generally used are type (*c*) or type (*b*) in which the tamping units are suspended from a frame attached to a rail mounted truck on which is placed

the compressor or generator. This arrangement reduces the fatigue of the operators. Alternatively, the compressor or generator may be mounted on a tractor moving along the verge. An example of the use of tamping machines after re-ballasting is given in the next section.

In Australia much the same policy is adopted but the use of tamping machines is not as widespread as in the U. S. A.

In Great Britain, types (*a*) and (*b*) are extensively used for tamping at switches and crossings. It has been found, however, that the weight of portable self-contained tampers is a great disadvantage particularly in electrified areas where the traffic is usually dense and the tamping unit has to be frequently lifted over the conductor rail. This disadvantage was found to be particularly serious during trials carried out by the London Transport Executive on whose lines there is a very intensive train service. The fatigue produced by lifting the unit over the conductor rail at such frequent intervals made it impossible for the operator to continue working for any useful period of time. The Western Region of the British Railways has on trial electric tampers driven from a petrol-generator for use at switches and crossings and these are found to be very satisfactory. The British Railways rarely employ tamping machines for spot-surfacing, reliance being placed on hand beating or measured shovel packing. « Out-of-face » tamping is not generally adopted but after track-renewals or large drainage works, etc., involving the disturbance of the ballast, the use of tamp-

Fig. 3. — Portable unit tamper. U. S. A.

ing machines is becoming increasingly widespread. At the present time the machine used for this purpose is the « Matisa » on-track machine in which the tamping bars are vibrated mechanically (fig. 4). The tamping bars are raised clear of the sleepers pneumatically while the machine is moved on to the next sleeper under its own power. This machine was recently used by the Southern Region of the British Railways in renewing and re-ballasting 3 miles of track in a tunnel. The machine worked immediately behind the relaying gang and tamped an average of 600 ft. per hour. Other Regions of the British Railways also use this machine for similar work.

Fig. 4. — Tamping machine.

It is the general opinion of all railways using tamping machines that no great reduction in maintenance costs is achieved over hand tamping, but that the advantage lies in the fact that a more uniform packing is produced and that the machine-tamping will last about 50 % longer than hand-tamping. Railways in the U. S. A. have found that the use of machines for « out-of-face » tamping considerably reduces the amount of spot-surfacing required.

In Great Britain, where the rail traffic is comparatively dense, the main advantage would appear to lie in the fact that the traffic operating speed immediately after track renewals or re-ballasting may be higher when tamping machines have been used than when the track is hand-tamped. In such cases it is usual to impose a speed restriction of 15 m.p.h. after hand-tamping, whereas in the case of machine-tamping this can be raised to 30 or 40 m.p.h. with considerable advantage to the Operating Department. This fact enables longer lengths of track to be relaid at one time than was previously possible.

(g) *Track jacking.*

The only railways reporting the use of power-operated jacking machines are those in the U. S. A., where they are frequently used for large re-ballasting or track-lifting work. The machines are track-mounted and clamped to the rail where a lift is desired. The track is raised by hydraulic or screw jacks operated by a petrol engine. The machine can be lifted off the track by four men (fig. 5).

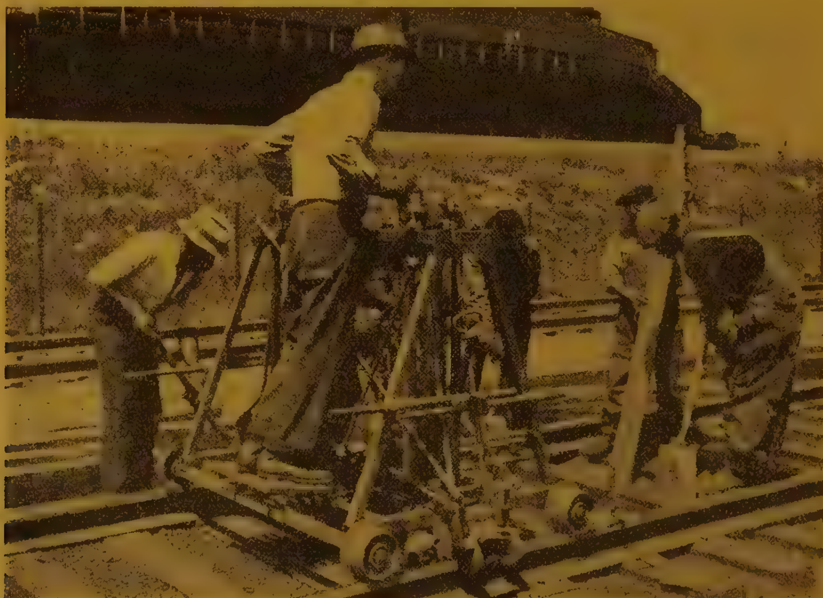


Fig. 5. — Track jacking machine. U. S. A.

An example of the use of power jacks combined with power tamping machines is given in the May 1947 issue of *Railway Engineering and Maintenance*. During 1946 the Pennsylvania Railroad Company converted 36 track-miles from cinder to stone ballast, the track being lifted a minimum of 8″. Level pegs were set at intervals of 50 feet and the new ballast spread on the track. Two power jacking machines were used, the first raising the track at each level peg and the second, working a rail length behind the first, raised the track in between the pegs. Four labourers worked with each jacking machine, temporarily packing the sleepers. A 12-man gang followed, spreading the ballast and filling the cribs and this gang was followed in turn by two power tamping machines. These were of the type in which a heavy cross-head with attached tamping bars is lifted and allowed to fall under its own weight. The total labour force numbered some 100 men and completed an average of 2 500 feet of track per day.

(h) *Ballast cleaning.*

Railways in the U. S. A. use a variety of machines for this purpose. They are

of two distinct types. Those which clean the ballast at the ends of the sleepers and in the six-foot way and those which clean the ballast in between the sleepers (« cribbing » machines). One machine of the first type will clean the ballast shoulder as an off-track machine or from the six-foot way as an on-track machine. The ballast is removed, riddled and clean ballast returned to the track, the dirt being machines in batteries of three, working some distance apart. The cleaning speed of one machine is approximately 1 500 lineal feet per hour. Where the ballast is exceptionally foul, two passes are made, the first to loosen the ballast and allow it to dry and the second to perform the cleaning.

Another railroad has recently developed an on-track machine capable of cleaning the shoulder ballast and that

Fig. 6. — Ballast cleaner. U. S. A.

deposited in the cess (fig. 6). When operating, it travels along a special rail laid on the ends of the sleepers.

The Pennsylvania Railroad uses on-track machines for cleaning the ballast either in the six-foot way or at the shoulder (fig. 7). The machine is self-propelled and the digging is performed by an endless chain of buckets. All operations are electrically driven from a diesel-electric generator. Cleaned ballast is returned to the track and the dirt conveyed to special wagons which are removed when filled and the dirt dumped. It is usual to operate these in the six-foot way simultaneously. The machine is pushed by a locomotive and the digging is performed by wheels 12 ½ feet in diameter, one on each side of the machine, with buckets in the periphery. The wheels are individually operated and powered by 135 horse-power engines. In 1946 this machine cleaned 720 miles of track at an average of 3 ½ miles per day.

There are various types of cribbing machines in use in the U. S. A. One of these is an on-track machine and deposits the material beyond the ends of the sleepers by means of diggers

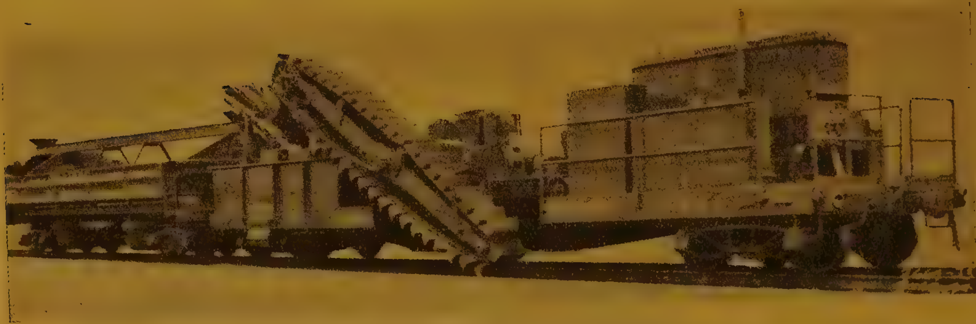


Fig. 7. — Ballast cleaner. U. S. A.

Fig. 8. — Cribbing machine. U. S. A.

attached to an endless chain. The chain travels round a specially shaped boom which is lowered from the outside of the track, under the rail and into position between the sleepers. When the ballast has been removed from the crib, the boom is raised and the machine moved on to the next crib (fig. 8).

Another on-track cribbing machine pushes the ballast up into the centre of the track by means of hydraulically operated rams. The ballast is then picked up and cleaned by a bucket excavator and screened following the cribbing machine.

A further on-track machine has digging bars connected to a cross-head which is allowed to fall under its own

weight. Transverse action is applied to the digging bars by means of cams and the ballast is deposited at each end of the sleeper.

In yet another type, a scoop is drawn through the crib and the removed ballast deposited outside the sleeper ends. The scoop can be operated by a tractor travelling alongside the track but the ballast has frequently to be loosened before the machine will operate efficiently.

track is jacked up and placed on temporary blocks to allow the machine to operate. All the movements are driven by individual electric motors which obtain current from a diesel-electric generator.

Ballast cleaning machines in general use on the British Railways at present are limited to petrol-driven sieves which are placed in the cess, the ballast being removed and replaced by hand (see fig. 10). The Southern Region has fixed

Fig. 9. — Ballast cleaner. British Railways.

It will be noticed that with the cribbing machines a second machine is required to pick up and clean the ballast removed.

It appears that no machine is used in the U. S. A. which is capable of removing and cleaning ballast from underneath the sleepers but the British Railways have carried out trials with the « Matisa » Ballast Cleaner (fig. 9). This is an on-track machine which removes the ballast by means of a bucket chain travelling underneath the sleepers. The

one of these machines to a well-type rail trolley so that the ballast is returned direct to the track after screening.

Considerable saving in costs is achieved by ballast cleaning machines, owing to the large amount of labour displaced. Indeed, it may almost be said that, owing to the present labour shortage in the U. S. A. and Great Britain, the use of such machines is the only possible method of cleaning ballast effectively over long lengths of track.

(i) *Building up battered rail ends by welding.*

This is done in the U. S. A. to rail-ends on plain line and to crossing noses and switches using either oxy-acetylene or electric-arc welding. The welding plant is usually mounted on a tractor moving along the verge or on a wagon. A variety of grinding machines are used for subsequently grinding the rail to correct contour and for cross chamfering the rail ends at joints. The Pennsylvania Railroad reports an increase in life of approximately 9 % as a result.

The Victorian Government Railway, Australia, adopt this process for crossing noses and rail-ends in station yards and on suburban lines, using oxy-acetylene welding and pneumatic grinding wheels driven by an off-track compressor.

The South African Railways use electric-arc welding for rail-ends and both oxy-acetylene and electric-arc welding for crossing noses. Grinding is done by a petrol-driven on-track grinding machine.

The Ceylon Government Railway builds up crossing noses by electric-arc welding and uses electric grinding wheels driven from the welding plant generator.

The British Railways use oxy-acetylene welding on crossing noses and switches but here the process can hardly be said to be mechanised as the gas bottle containers are merely placed in the cess and moved along on a hand trolley, final surfacing being done by hand forging. Increase in life of crossings of up to 30 % is reported, while the London Transport Executive state that after the introduction of welding, one crossing, which was previously

Fig. 10. — Ballast riddler. British Railways.

renewed every two weeks, remained in the track for two years, the noses being built up every six months.

All the above railways employ special gangs for this work.

An example quoted in the July 1947 issue of *Railway Engineering and Maintenance* describes the procedure adopted by the New York, New Haven and Hartford Railroad. The welding gang consists of two welders using oxy-acetylene hand torches.

Surfacing is done by two electric grinders each mounted on a light frame fitted with flanged wheels, the unit weighing less than 200 lbs. Two men are required to operate each machine.

This railroad has developed a method of surfacing using a horizontal cutting torch mounted on a travelling carriage combined with a hand-held pre-heating torch. The machine weighs less than 100 lbs. and is operated by the welder himself with one helper. No grinding is required.

(j) *Rail grinding.*

Grinding machines are used not only in connection with building up rails by welding, but also for surfacing corrugated rails, shaping stock rails, cross chamfering rail ends to prevent chipping and surfacing rail joints welded by the Thermit process. All these operations are performed in the U. S. A. The machines used may be petrol-driven self-contained units mounted on a light frame and provided with flanged wheels or pneumatic tyres for easy manœuvrability. Alternatively, grinding wheels, hand operated or fixed to small frames clamped to the rails may be driven electrically, pneumatically or through a flexible shaft driven by an off-track petrol engine or by the engine of an on-track machine. Where provision is made for drive through a flexible shaft, such machines may also be used for driving other tools such as rail drills. One grinding machine has four electrically driven grinding wheels mounted on a frame fitted with flanged wheels. Power is obtained from a generator mounted on a tractor moving along the verge.

The London Transport Executive use grinding machines for surfacing site welded joints in conductor rails. The types used are : (*a*) a light petrol-driven rail mounted machine, (*b*) hand operated grinding wheels driven through flexible shafts from an off-track petrol engine, (*c*) hand operated grinding wheels driven through flexible shafts from an off-track electric motor which obtains its power from the welding plant generator.

The East African Railways have constructed an on-track machine which has eight pneumatically operated grinding wheels attached to the frame. The machine is pushed by a steam locomotive. This machine is still in the experimental stage.

**7. Track renewals.**

As already mentioned, it is important to distinguish between the various methods of renewing track used in different countries. In the U. S. A. the general practice is to renew rails and fastenings over long lengths of track, dismantling and assembling the track on site and to renew sleepers by « spot-sleepering ». In Great Britain two methods are used. Firstly, the complete renewal of the track, dismantling and assembling being done at the site and secondly, the removal of assembled track in complete lengths and the mechanical laying of similar lengths pre-assembled at a depot. All other countries generally adopt the first system used in Great Britain, except in Australia, where the Victorian Government Railway places the rails alongside the track and fishplates them into as long lengths as possible. They are then barred into position and the track subsequently re-sleepered.

The only countries reporting the general use of mechanical equipment for track renewal are the U. S. A. and Great Britain.

In the U. S. A. the introduction of mechanical equipment has not changed the basic policy of re-railing and spot-sleepering but power tools are now provided for all operations that were previously done by hand.

Fig. 11. — Wagons loaded with pre-assembled track lengths. British Railways.

In Great Britain, the introduction of mechanical equipment has led to the adoption of the pre-assembled method of track renewal and the length of track so laid is increasing year by year. This method aims at employing power operated tools at depots and workshops for pre-assembling the track in lengths of 60 feet and the use of heavy mechanical plant for lifting the old track in similar sections and laying the new lengths. Thus the number of manual tasks to be performed at the relaying site is reduced to a minimum. Power tools are not provided for tasks that cannot be performed at the depot or workshops such as removing and replacing fishplates and fixing track-circuit and rail bonds. The old track is broken down at a depot and the materials dealt with in the usual way. Where the method of track renewals by dismantling and assembling the track on site is still used, power tools are not generally provided.

In Australia, the Victorian Government Railway reports the use of pneumatic spike drivers and wood augers when renewing track by dismantling and assembling on site. This Railway has other power tools on trial. In all other countries replying to the questionnaire, the track renewals are done entirely by hand, although the South

African Railway proposes to carry out trials of mechanised tools.

*(a) British practice of laying pre-assembled track with cranes and track-layers.*

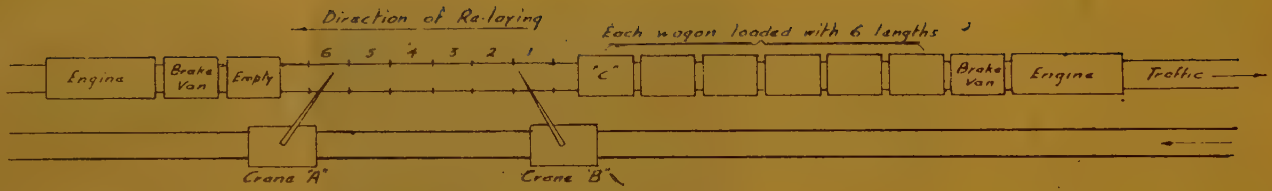
This practice is used by most of the Regions of the British Railways and up to 20 % of the track-renewals are done with pre-assembled track.

used which supports each length at points 36-ft. apart and special lifting claws are provided which can be quickly operated (fig. 12). The lengths of old track removed are loaded on to bogie wagons and dismantled at a District or Divisional Depot. One or two cranes may be used at the site during the operation and the procedure for each method is described in detail in figure 13.

Fig. 12. — Crane lifting pre-assembled track length. British Railways.

Rail, fastenings and sleepers (chaired at a central depot) are sent to a District or Divisional Depot where they are assembled into 60-ft. lengths of track and loaded on to bogie wagons for transport to the site (fig. 11). The old track is removed in similar lengths and the new lengths laid, using rail-mounted travelling cranes. A spreader beam is

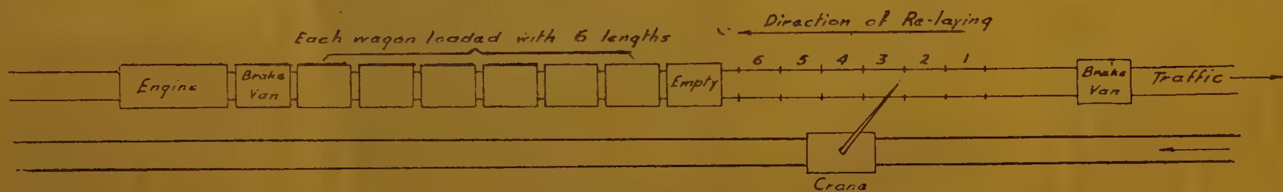
The two-crane method is rather faster than with only one crane, but the rate of relaying varies with the location. The work is usually done during a Sunday possession and up to 1 mile of track may be renewed in one operation. Generally speaking, the average rate of laying is 720 lineal feet of track (or 12-60 ft. lengths) per hour using two




*Two crane method.*

*Operations :*

1. Crane « A » loads lengths 1 to 6 on empty wagon.
2. Formation prepared to receive new track.
3. Crane « B » lays new track lengths 1 to 6 and all joints fishplated.
4. Wagon « C », now empty, is run forward over new track to position previously occupied by first empty wagon.
5. Cycle repeated.




*One crane method.*

*Operations :*

1. Crane loads lengths 1 and 2 on empty wagon.
2. Crane lays new track length 1 and fishplates are bolted on.
3. Crane removes length 3 and returns with new length 2.
4. This is repeated until new lengths from first loaded wagon are laid.
5. Original empty wagon now loaded with lengths 1 to 6 of old track is run back to brake van.
6. Cycle repeated.

Fig. 13. — Procedure for laying pre-assembled track. British Railways.

cranes, but under favourable conditions the London Midland Region have laid as many as 40 lengths per hour. During a week-night possession the Southern Region frequently renews up to 1 000 ft. of track at an average rate of approximately 300 ft. per hour, using one crane. The length of track to be renewed is more often than not decided by the maximum length over which a speed restriction may operate. The relaying gang consists of 40-50 men. Savings in cost of from 25 to 33 % compared with renewals by hand are reported as a result of laying pre-assembled track by this method. This saving in cost does not appear to have been the primary reason for adopting this method, however welcome such a saving might be. Rather is it because of the greater amount of work that can be done in one possession period (these periods being very limited on the British Railways) and the reduction of heavy manual labour at a time when suitable man-power is still difficult to obtain.

The Southern Region have recently designed and constructed a special track-layer (fig. 14). This machine is designed to work within the loading gauge for use in tunnels, under bridges and other places where it is impossible to use a crane. This machine also obviates the difficulty when renewing either of the centre tracks of four lines by crane, of temporarily blocking the outside line due to the crane tail-swing. Lifting is by two separately controlled compressed air winches and the machine is propelled by a steam locomotive in the open and by a diesel-electric shunting locomotive in tunnels. The procedure for track renewal is the same as that described previously, except that

Fig. 14. — Track-layer. British Railways.

the track-layer takes the place of the crane. The speed of working is not appreciably altered.

The Eastern Region used the Morris Track Layer prior to 1939, but it was found to be rather slow and cumbersome and has not been used since that year (fig. 15). This machine works on the track which is to be renewed, the sections being suspended from a cantilever projecting in front of the machine. Thus it is possible, to renew single line track using pre-assembled lengths. A system of pre-assembed re-laying on single line track using cranes has been developed experimentally by the Southern Region.


Fig. 15. — « Morris » track-layer. British Railways.

(b) *Track renewals in the U. S. A. using mechanical equipment.*

In the U. S. A. many railways employ large gangs using a variety of mechanical equipment. These gangs are usually highly specialised and employed solely on track renewals, working wherever required on the system and often living in special trains equipped for that purpose. This system of specialisation tends to increase the efficiency of the gang as the skill of the machine operators increases with practice. In order to keep the output of the gang as high as possible, the track is renewed in long lengths, usually several miles. Two or more gangs, placed some distance apart, may work simultaneously on the same length.

Each gang is divided into small sections, each section following the other and performing one type of work only. They are equipped with as many mechanical tools as may be necessary or available and so arranged that the speed of working of each section is the same

throughout. Such a gang may occupy one third of a mile of track and re-rail up to 2 track-miles per day. This work is sometimes let to contract.

A list of many of the types of power tools which may be used is given in Table III.

Extensive use is also made of other mechanical equipment. Motor trollies are used for conveying small tools and materials. Rails are laid by track cranes, crawler cranes, tractors with side boom or rail-laying machines. One type of rail-laying machine has flanged wheels running on one track rail and rollers running on a light moveable rail placed on the sleepers and moved along as the work progresses. This machine is petrol driven and can be easily set off the track.

### (c) *Track renewal with long welded rails.*

The Victorian Government Railway, Australia, has laid welded rails up to 270 feet long. They are transported to the site on five flat-topped trucks carrying 32 rails and discharged over the side by means of skids and ropes. Longitudinal movement is made on rollers or special trolleys. Where such rails are to be laid in tunnels they are off-loaded in the open as near to the site as possible and pulled in by locomotive power. The rails are barred into position on the sleepers. The old rails are barred out and cut into short lengths for hand loading unless they are to be re-used, when they are pulled end-on to trucks by power.

Welded rails 120 ft. long have been laid in the open by the South African Railways since 1938. They are loaded on to two flat-topped wagons, the rails being supported on special bolsters pivoted at the centre of each truck and resting on transverse slides at intermediate points. This enables curves to be negotiated with the wagons loaded to their maximum capacity. Sixty 96-lb. rails can be carried on each set of wagons where the strength of bridges permits. The rails are end off-loaded and barred into position. Welded rails up to half a mile in length have been laid in tunnels. These are formed by Thermit welding 120-ft. lengths together in the open as near to the site as possible and they are then moved into position on two-wheeled trollies spaced 30-ft. apart. The old rails are barred out and cut into 40-ft. lengths for hand loading. Experiments are shortly to be made with welded rails in lengths of 240 feet, 480 feet and 960 feet.

Long welded rails are used extensively in the U. S. A. The usual method is to use rails in as long lengths as possible up to several thousand feet. Such rails are welded in depots constructed as near to the site as possible. In one case a special train placed in a convenient siding was used for this purpose. The rails are transported to the site on bogie wagons and curves of 6 chains radius can be successfully negotiated. The rails are end off-loaded and placed in position with the aid of cranes. The Bessemer and Lake Erie Railroad reports that rails one mile long have been laid experimentally. They were dragged to the site one at a time along the track by locomotive power and placed in position with cranes.

The only British Railway making extensive use of long welded rails is the London Transport Executive, a large proportion of whose lines are in tubes, lined with cast-iron segments. The rails, in 300 feet lengths, are transported to the site on bogie wagons from which they are lifted by means of blocks and tackles suspended from the tube roof. The wagons are then withdrawn, the old rail barred out and the new rail lowered into position, being guided into the chairs by tubular steel « A » frames. The old rail is then lifted with the

tackles and lowered into the wagons which are placed underneath. When laying track in new tube tunnels a runway for the pulley blocks, constructed of rolled steel joists in short lengths prefishplated together, is suspended from the roof of the tunnel. By this means the rails are pushed ahead of the work position. The Southern Region of the British Railways reports the occasional use of Robel cranes for laying welded rails (fig. 16) but they are now investigating the possibility of laying pre-assembled track in lengths of 180 feet using three mechanised track-layers as previously described coupled together and provided with central control. Experiments carried out with this end in view have established the practicability of transporting such lengths of pre-assembled track on bogie wagons.

Fig. 16. — Laying welded rails with « Robel » cranes. British Railways.

train and lowered into position. In the open, the rails are end off-loaded and placed in the chairs with the aid of levers fixed to light tubular steel frames. More extensive use of long welded rails by the British Railways is now under consideration and the Western Region proposes to use one-wheeled hand barrows from which the rails are suspended in tongs to assist in placing the rails in

It is the general opinion that the cost of laying long welded rails is much the same as for short length rails, but maintenance costs are reduced and improved running results.

### (d) *Track renewal by the Diplory method.*

No railways report the use of the Diplory method for renewing track, although the British Railways have the subject under consideration.

Fig. 17. — Breaking up beds during track renewal. British Railways.

### (e) *Breaking up existing beds.*

The British Railways have experimented with tractor drawn harrows for breaking up beds with satisfactory results (fig. 17). All other railways report that this is done by hand when renewing track.

### (f) *Consolidating new beds.*

No railway reports the use of any mechanical method of consolidating new beds when renewing track, but the Victorian Government Railway, Australia, has used rollers on completely new lengths of line with good results.

(g) *Renewal of switches and crossings.*

The British Railways renew a large proportion of switches and crossings by pre-assembling into convenient sections and placing them by means of rail-mounted travelling cranes of varying capacity. Units up to 8 tons weight are laid, although the size of the unit is more often than not limited by the loading gauge when travelling to the site. This procedure is adopted in order to reduce the length of possession period required for the operation and no appreciable saving in cost is achieved.

The Victorian Government Railway, Australia, adopts this method when renewing switches and crossings in congested areas.

This method is occasionally used in the U. S. A. but no details have been provided.

(h) *Hopper wagons.*

The use of hopper wagons for transporting and placing ballast in the track after renewals or when re-ballasting is the general practice in the majority of railways replying to the questionnaire. They vary in capacity from 16 to 90 tons and may be side or centre discharging, or both. Most railways report the use of ballast ploughs for spreading the ballast. Special cars equipped with blades and brushes are used for this purpose in the U. S. A.

## 8. Conclusions.

The use of mechanical equipment is by no means general practice amongst the Railways considered in this report and such methods are adopted chiefly by railways in America and Great Britain, although other railways are contemplating their introduction and in some cases are now carrying out trials with various types of mechanical plant.

The use of such equipment has been forced on railways in America and Great Britain by shortage of labour and by rising labour costs. Only by the introduction of such methods in order to raise the output per man-hour is it possible to complete the necessary amount of annual track-maintenance or to do so within the allotted expenditure.

In the U. S. A. the introduction of mechanical equipment has led to the formation of highly specialised extra gangs performing as much of the maintenance work as possible and the work of local length gangs has been reduced to patrolling and minor repairs. In Great Britain the tendency is to increase the responsibility of the local length gangs by the use of mechanical equipment and to employ extra gangs as seldom as possible for carrying out maintenance work as distinct from track renewals. In this country mechanisation has also led to the development of the pre-assembled method of track-relaying.

Power machines are now obtainable for nearly every possible operation in the maintenance of the permanent way, but these machines do not only replace hand methods, they make possible operations which are prohibitively uneconomical by manual labour (e.g. large earth moving projects, stabilisation of formation by driving piles, etc.) and permit the introduction of entirely new methods of maintenance (e.g. rail grinding, building up battered rail ends by welding, reconditioning fishplates in the track by heat treatment, etc.).

Considering all the countries included in this report as a whole, the mechanisation of the maintenance and renewal of permanent way can be said to be still in its infancy, but more mechanical plant is being used each year, with North America well in the forefront and closely followed by Great Britain.

Except in the U. S. A. no great attempt is made to analyse the savings in maintenance costs achieved by the use of mechanical equipment and this is a subject worthy of closer investigation, but there is little doubt that the wider use of such plant can produce considerable saving in expenditure for the maintenance and renewal of the permanent way.

## b) Recent improvements relating to reinforced concrete and pre-stressed concrete sleepers. Results obtained.

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### 1. Scope of report.

The use of concrete sleepers was first adopted experimentally by several countries following the 1914-1918 war and conditions created by the 1939-1945 war again turned the attention of some railways to the possibility of their more extensive use. However, experiments made both before and during the latter war did not produce entirely satisfactory results and considerable difficulties and limitations in use have been encountered. It is the purpose of this report to summarise the steps now being taken by railways in America, Great Britain, the British Dominions, Protectorates and Colonies, China, Egypt and India, with a view to improving the design of concrete sleepers and widening their field of use. The report includes details of the design and manufacture of concrete sleepers now in use and a summary of research work undertaken during the last few years.

### 2. Source of information.

In June, 1948, a questionnaire was sent to 30 Railway Organisations in the countries listed above. Of these 17 railways replied and this report has been compiled from information provided by them.

### 3. Reasons for using concrete sleepers.

Except in the case of the East African Railways who are experimenting with a combination of concrete sleepers and blocks in a locomotive yard where steel sleepers are subject to heavy corrosion from engine ash, the railways now experimenting with concrete sleepers have taken this step reluctantly and in some cases unavoidably owing to difficulties in obtaining the type of sleeper normally used. Except in the case of the East African Railways mentioned, advantages of concrete sleepered track over normal track have not been looked for nor, in fact, realised. The use of concrete sleepers has been forced on the British Railways by restrictions imposed on the importation of timber. The reasons given by the Indian Railways (which normally use both timber and steel sleepers) for investigating the possibilities of using such sleepers are limitations in the supply of indigenous timber, curtailments of imports and shortage of steel supplies.

### 4. Extent of present use.

It is only in Great Britain and India that experiments are being carried out on any large scale and the steps now being taken by railways in each of these countries in order to determine the most suitable design of concrete sleepers and the extent of their possible use is described later in detail. The use in other countries is very limited and there is consequently little to report from them.

#### (a) *Great Britain.*

Concrete blocks combined with timber or reinforced concrete through-sleepers placed after every second or third pair of blocks have been laid on several miles of sidings since 1940. The blocks are constructed either of plain or reinforced concrete and their manufacture, which is done in railway depots, follows normal practice and calls for no special comment. Some Regions of the British Railways also use reinforced concrete blocks with steel gauge ties in sidings and on a limited mileage of minor running lines. In this case a gauge tie may be provided to each pair of blocks and through-sleepers spaced at intervals varying with the classification of the line or, alternatively, through-sleepers may be dispensed with and gauge ties provided at every second or third pair of blocks and at rail joints. The latter arrangement is confined to sidings and goods lines. These blocks are reinforced with welded steel fabric and this has proved far more satisfactory than bar reinforcement. The concrete is usually vibrated during manufacture. Experiments have been made with concrete blocks in which cement grout is poured into a mould filled with sand and aggregate.

Reinforced concrete sleepers have been used since 1940 both in sidings and on a limited mileage of running lines. After exhaustive tests it has been found that these will not stand up satisfactorily to fast traffic and on more important lines they have now been superseded by pre-stressed concrete sleepers which are manufactured by outside contractors. Reinforced concrete sleepers manufactured by the railway are, however, still used in sidings and minor lines (fig. 1). An experimental sleeper with bar reinforcement has been designed by the British Railways to withstand unfavourable conditions of packing, particularly centre binding (fig. 2).

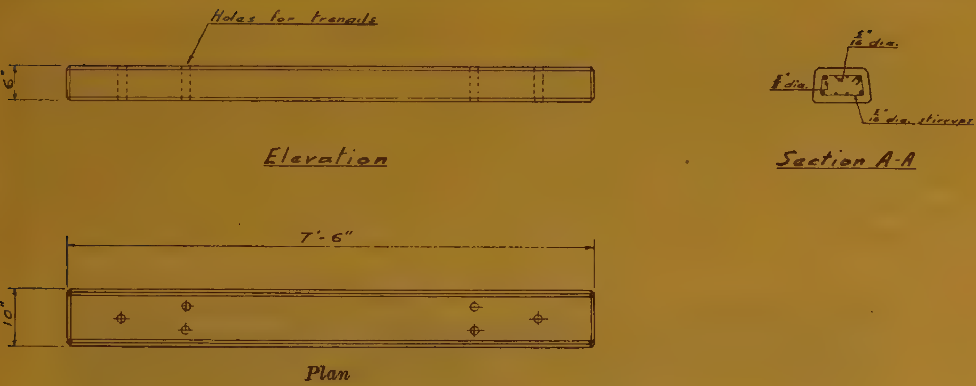



Fig. 1. — Reinforced concrete sleeper. British Railways - Southern Region.

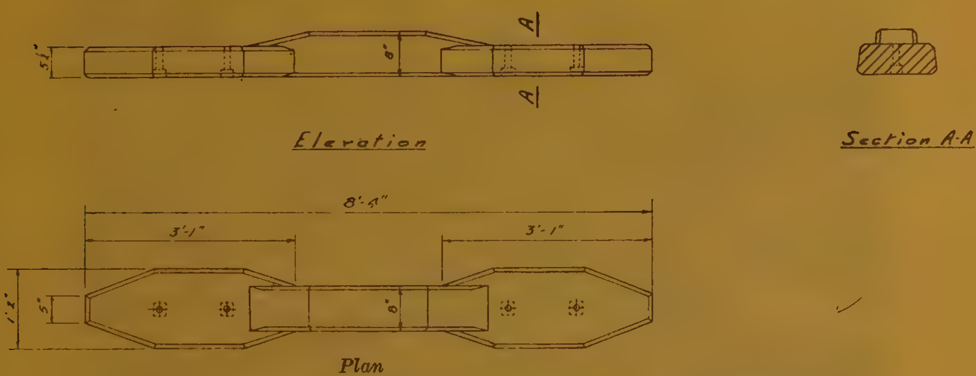



Fig. 2. — Experimental reinforced concrete sleeper. British Railways.

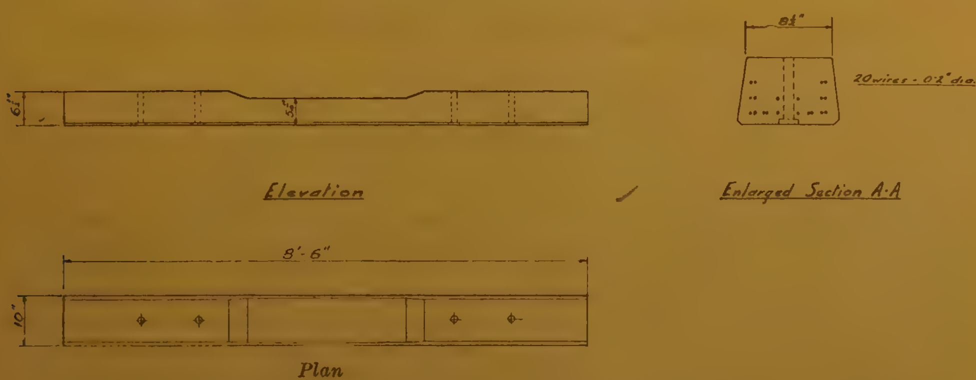



Fig. 3. — Pre-stressed concrete sleepers with bond anchorage. British Railways.

In order to produce a satisfactory sleeper or block, sound design and quality of workmanship are essential, therefore a British Standard Specification has been drawn up in consultation with the railways concerned which lays down recommendations for the design and manufacture of concrete blocks and reinforced and pre-stressed concrete sleepers. This Specification is amended from time to time when practical experience indicates where improvements could be made. Extracts from this Specification, together with details of the standard load test for selected sleepers of each batch are given in Appendix A, which is included by permission of the British Standards Institution, London, S. W. 1.

Two types of pre-stressed concrete sleepers are at present used by the British Railways. In one of these (fig. 3) anchorage for the wires is by bond alone and the sleepers are cast end-to-end on tensioned wires up to 400 ft. long. The moulds, through which the wires pass, are first filled with concrete, using rapid hardening cement and vibrated on a vibrating table. The moulds are then moved along to the other end of the wires on rollers where the concrete is vibrated a second time. A gap of about 6″ is left between the ends of each mould and the wires cut after the tension has been released. The sleepers contain 18 or 20 pre-stressing wires each 0.2 inches in diameter and the stress after tensioning is 65-68 tons per square inch. Figure 3*a* shows these sleepers in course of manufacture.

Fig. 3*a*. — Pre-stressed concrete sleepers with bond anchorage in course of manufacture. British Railways. [By permission of Dow-Mac (Products) Ltd.]

The other type (fig. 4) has positive anchorage for the pre-stressing wires

which pass around steel anchorages placed transversely in the sleeper at each end. This latter type is of more recent design and it is not possible as yet to give details of its behaviour under traffic.

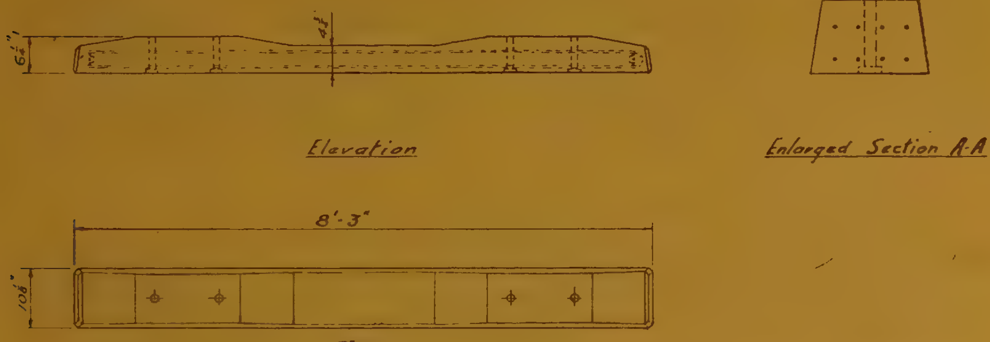



Fig. 4. — Pre-stressed concrete sleeper with positive anchorage. British Railways.

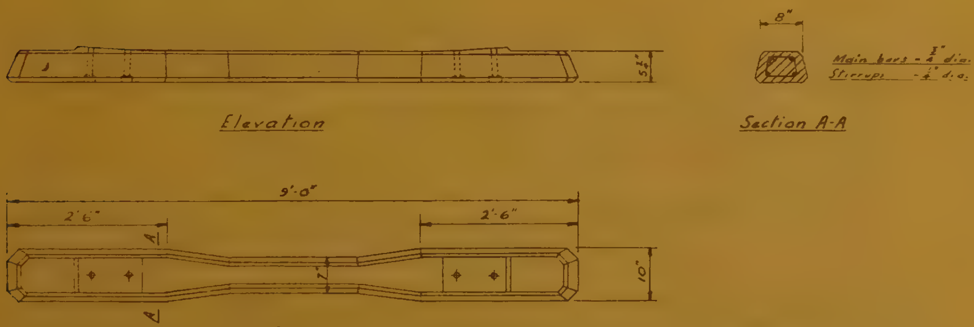



Fig. 5. — Reinforced concrete sleeper for use on main line track. Indian Government Railways.

(b) *India.*

The Indian Railways have designed and manufactured various types of concrete sleepers and in 1946 installed them in the track on test, the majority of them in sidings. These types consist of (I) reinforced concrete through-sleepers for use on broad gauge (5'-6") and metre gauge track (figs. 5 and 6); some of these are intended for use on main lines and others solely for sidings: and (II) reinforced concrete blocks, (each pair of which is held to correct gauge with a steel tie) used on lightly loaded broad gauge tracks where a 75-lb. rail is used (fig. 7). A combination of reinforced concrete blocks and timber through-sleepers is used on several miles of sidings. A few pre-stressed sleepers of the types used in Great Britain have been installed in the track on trial and they have been found less satisfactory and economical than

the standard timber, cast-iron or steel sleepers. A design for a pre-stressed concrete sleeper in which the pre-stressing wires are anchored by bond to the concrete has been prepared (fig. 8) and Appendix A). The rail reactions are taken to be 15 tons for broad gauge and 11 tons for metre gauge track distributed over areas of 420 sq. inches and 264 sq. inches respectively.

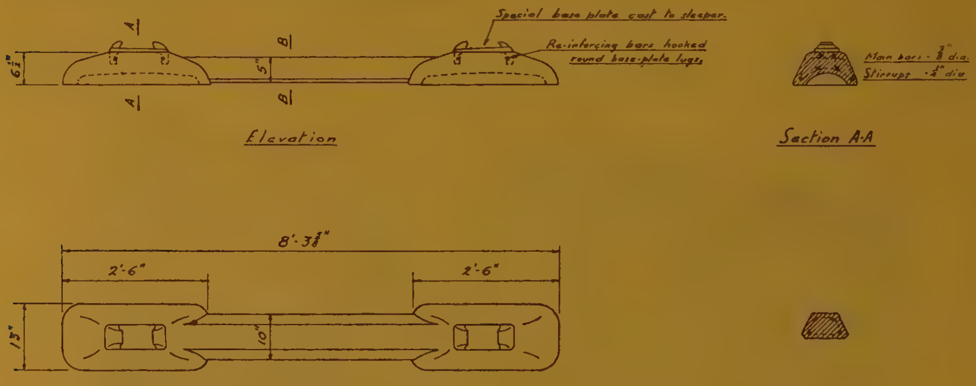



Fig. 6. — Experimental reinforced concrete sleeper. Indian Government Railway.

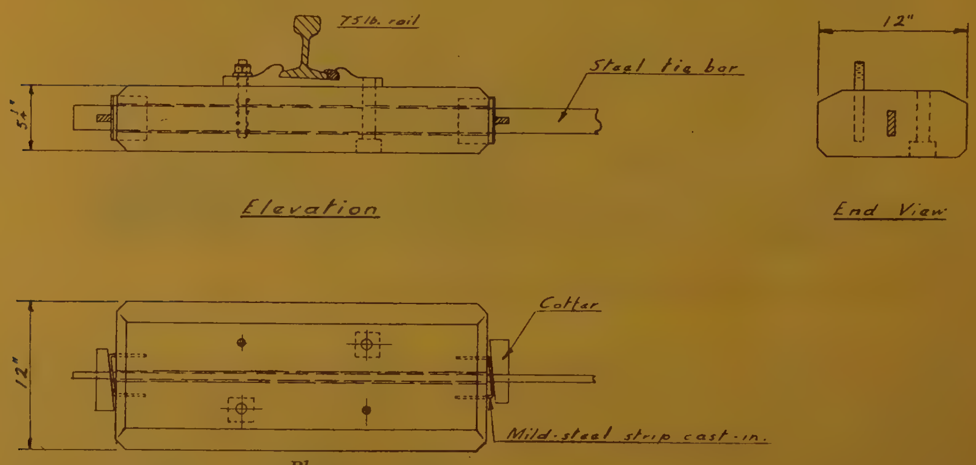



Fig. 7. — Reinforced concrete sleeper block for use in sidings. Indian Government Railways.

arrangements made for manufacture in India.

Concrete sleepers are designed and manufactured in accordance with the British Standard Specifications (see

In manufacturing the reinforced concrete sleepers, a concrete mix of 1: 2: 4 or 1: 1½: 3 is used, the water content being specified as 28 % (by weight) of the cement plus 4 % (by weight) of the

sand and aggregate. Portland cement is used and all materials are in accordance with the appropriate British Standard Specifications. The slump test is used to test the mix and water content of the concrete, a slump of $^3/_8''$ to $^5/_8''$ being specified for vibrated concrete. The concrete is vibrated with surface vibrators at top and bottom and also with an internal vibrator. The form-work is removed after 24 hours and the pit in which the sleepers are cast is flooded with water whilst the concrete is curing.

the East African Railways has already been mentioned.

In the U. S. A. a considerable number of reinforced concrete sleepers were laid during the inter-war period but these are gradually being removed from the track as they become worn out and further use of this type of sleepers is not contemplated.

The Sudan Railways have recently installed 200 pre-stressed concrete sleepers of the type used in Great Britain in order to test their behaviour under traffic.

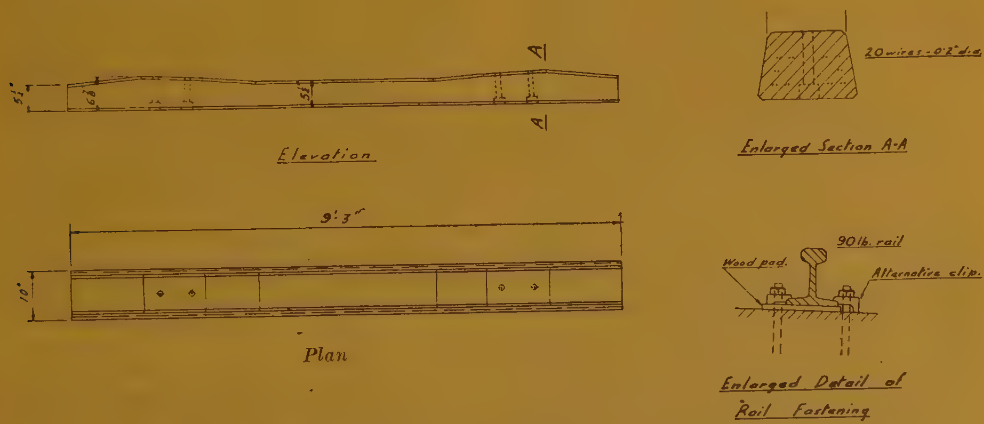



Fig. 8. — Pre-stressed concrete sleeper for use in main line track. Indian Government Railways.

### (c) *Other countries.*

The Costa Rica Railway have laid concrete sleepers experimentally but an adequate supply of home-grown timber sleepers has now been obtained, the cost of which is only about one fifth of that of the concrete type.

In South Africa, reinforced concrete blocks have been used during the recent war in sidings with either a normal sleeper or a steel tie after every third set of blocks. The experimental laying of such track in a locomotive yard by

## 5. Rail fastenings.

The British Railways secure chairs (for bull-head rails) to concrete sleepers by (*a*) through bolts, (*b*) bolts screwed into cast-in nuts or metal sockets or (*c*) screws or spikes inserted into tre-nails or cast-in plugs. Chairs are secured to concrete blocks by any of these means, or, alternatively, the chairs are positioned on the block in the mould and screws or spikes inserted into the concrete before setting. The top surface of the sleeper is made flat and rail cant

provided by the chair. Pads of wood, cork or tarred felt are used between the chair and the sleeper. No marked preference in the type of rail fastening used has so far emerged. As yet flat-bottom rails have only been used with concrete sleepers experimentally but recommendations have been made for fastening such rails using sole plates and flange clips in running lines, rail cant being provided by the sole plate. In sidings and goods loops the top surface of the sleeper may be canted and the sole plate dispensed with.

In India, concrete sleepers and concrete blocks are generally used with flat-bottom rail and cast-iron base plates, the rail being fastened with through bolts and flange clips or, alternatively, a special base-plate is positioned on the sleeper during casting, the rail being held with mild-steel keys. In the latter case, the requisite rail cant is provided either by the base plate, or by the seating on the sleeper. On the pre-stressed sleeper to be manufactured in India no base plate is used, the rail resting on a hardwood pad and fastened by through bolts and flange clips. Hessian pads soaked in bitumen have been tried but these were crushed and experiments are now being made resting the rails directly on concrete sleepers and concrete blocks.

### 6. Packing.

The British Railways lay concrete sleepers in running lines on normal stone ballast and chippings although in some cases rather smaller chippings than used with timber sleepers have been found advantageous for packing. It has been found that a trench left in the ballast in the centre of the track tended to produce instability and this practice has now been discontinued. Normal shovel packing or measured shovel packing is used for maintaining the track to correct level. In sidings, concrete sleepers and blocks laid on ashes usually give little trouble except where the formation is clay. One Region of the British Railways reports that stone chippings have been found to be far more satisfactory for packing concrete blocks but that the general adoption of this practice in sidings is uneconomical.

The Indian Railways have as yet laid only a small number of concrete sleepers in running lines but sleepers and blocks laid on ashes in sidings have proved satisfactory. Sleepers laid on stone ballast without chippings have developed cracks in the centre of the track and this has been obviated by leaving a central trench in the ballast. Hand beater packing has been tried but has not proved entirely satisfactory. Experiments are now being made with concrete sleepers laid on sand.

In all cases only a short length (15″ to 24″) on either side of the rail is packed. No experiments using mechanical tamping where concrete sleepers are installed have so far been carried out.

### 7. Use on track-circuited and electrified track.

Concrete sleepers and blocks are not used by the British Railways on track-circuited lines, nor is such use contemplated with the types available at the present time. The Indian Railways use concrete blocks on such lines and in this case the bolt head recesses in the underside of the block are made deeper than on other blocks and this recess is filled with bitumen to insulate the bolt head.

The British Railways have installed pre-stressed concrete sleepers experimentally in a short length of electrified track. No special provision was made for insulation and considerable trouble has been experienced through leakage

of traction current which returns through the running rails.

Experiments have been carried out by the British Railways to determine the possible path of current leakage and a summary of the results of these experiments is given in Appendix B.

### 8. Transverse and longitudinal bearers at switches and crossings.

The British Railways have laid an experimental set of pre-cast longitudinal bearers at one turn-out but this did not prove entirely satisfactory and their weight necessitated the use of crane power for laying-in. The use of transverse concrete sleepers is not considered favourably for this purpose as the variation in bolt hole spacing complicates the manufacture and the close spacing necessary makes it difficult to maintain adequate packing. The East African Railways have recently laid an experimental set of transverse turn-out sleepers but no details have been provided. No other railway reports experiments in this direction.

### 9. Concrete beam track.

In December 1946, the Eastern Region of the British Railways laid an experimental length of track in which the rails are supported on pre-cast concrete longitudinal beams held to gauge with steel ties. This track was described fully by J.-C.-L. TRAIN, M.C., M.I.C.E., in the *Bulletin of the International Railway Congress Association* for January 1947, and no further developments have been reported since that date. No other railway reports the use of this type of track.

### 10. Methods of laying-in.

The weight of concrete sleepers causes considerable difficulty when laying them in the track. The method generally adopted by the British Railways is to form « rafts » of eight chaired sleepers secured to a short length of second-hand rail. These « rafts » are loaded on to wagons and off-loaded at the site by means of crane power. The sleepers are then released from the carrying rail and distributed along the track by hand.

Experiments have been carried out in the laying of pre-assembled concrete sleepered track. The track is pre-assembled into 30 ft. lengths using unserviceable rails and these lengths are lifted and placed into position by rail-mounted travelling cranes working on the track adjacent to that to be renewed. The second-hand rails are then removed and replaced by new rails in 60-ft. lengths (i.e. standard rail length). The re-railing is done either by hand or with the aid of the crane. The Southern Region of the British Railways has developed experimentally a similar method on single line track and has also made trials of unloading concrete sleepers, one at a time, from the wagons down a ramped roller conveyor.

It is obvious from reports received that the British Railways are continuing to experiment with methods of « laying-in » concrete sleepers, and it would appear that one or more practical schemes will be forthcoming shortly.

### 11. Research.

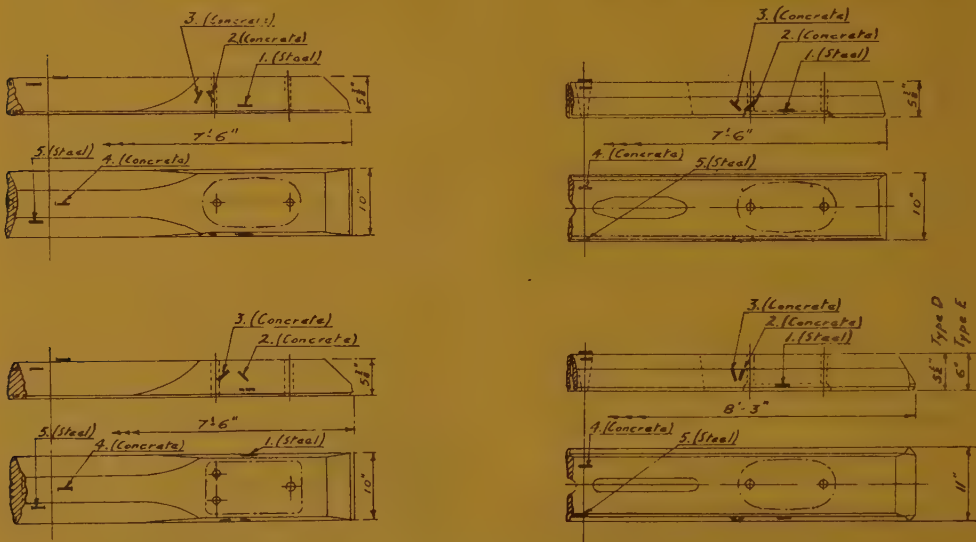
The British Railways have carried out during the last few years a considerable number of tests on the strength of concrete sleepers and blocks both in the track under traffic conditions and in the laboratory. However, within the limited space available it is only possible to include summaries of a few of these tests.

#### (a) *Tests on concrete sleepers in the track.*

In 1942 tests were carried out at Cheddington by F.-C. JOHANSEN, M.Sc.(Eng.), M.I.Mech.E., F.R.Ac.S., M.I.Loco.E. of

the former L.N.E. Railway, and F.-G. THOMAS, Ph.D., B.Sc., M.Inst.C.E. of the Building Research Station on reinforced concrete sleepers laid in main lines. These tests were described in papers given before the Institution of Civil Engineers in 1944. Strain gauges were secured to the steel reinforcement and concrete of various types of sleepers in the positions shown on figure 9. The gauges used were 2 inch gauge-length scratch extensometers in which a succession of strains effecting the gauge points traces a zig-zag record on a chromium-plated target which is afterwards examined through a microscope fitted with a calibrated eye-piece scale. The measured strains were converted to stresses assuming moduli of elasticity of 29 100 000 lbs. per sq. inch for steel and 2 910 000 lbs. per sq. inch for concrete. A summary of the results obtained is given in Table A.

An investigation was also made into the pressure distribution under the sleepers. A « ball sandwich » consisting of 170 hardened steel balls resting on steel plates was placed between the underside of the sleepers and the ballast and the pressure distribution determined by measuring the indentations produced by the balls on the steel plates. This latter test indicated that with the types of sleepers tested there was little advantage to be gained by leaving a trench in the ballast in the centre of the track.




*Sleepers type B.* *Sleepers type D and E.*

Fig. 9. — Positions of strain gauges on concrete sleepers tested at Cheddington. British Railways. *(For results of tests see fig. 11.)*

Measurements were taken of chair reactions under fast traffic in order to determine the load imposed on a concrete sleeper. These measurements were taken both at Cheddington and at Forest Hill (where pre-stressed concrete sleepers were installed in electrified track) using a piezo-electric load gauge between the rail and the sleeper. A summary of the results of these tests is given in Table B.

TABLE *A*.

SUMMARY OF GREATEST STRESSES RECORDED IN EACH OF THE FIVE TYPES OF SLEEPER TESTED

(+ tensible — compressive.)

| Type of sleeper | No. of sleeper in rail length | No. of rail length | Greatest stresses (lb. per square inch) recorded at position : ø | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 (steel) | 2 (concrete) | 3 (concrete) | 4 (concrete) | 5 (steel) |
| A | 1 | 2 | + 13 600 | — | + 150 | — 250 | + 7 780 |
| | 2 | 2 | + 12 400 | — 50 | — 220 | + 390 | + 7 300 |
| | 12 | 3 | + 16 300 | + 170 | — 73 | + 290 | +12 100 |
| B | 1 | 3 | + 6 080 | 120* amplitude | {+(1 760)} † {+ 580} | — 410 | + 4 860 |
| | 2 | 3 | — | + 40 | 0 | — 580 | + 1 460 |
| | 12 | 2 | + 1 940 | + 170 | — 50 | — 290 | + 4 130 |
| C | 1 | 2 | + 11 420 | ± 73 | — 535 | + 490 | 4 860* amplitude |
| | 2 | 2 | + 10 200 | + 190 | — 24 | + 490 | + 2 670 |
| | 12 | 2 | — | — 60 | — | + 190 | — |
| D | 1 | 3 | — | + 170 | + 240 | — 730 | — 4 860 |
| | 2 | 2 | + 2 430 | — 50 | — 120 | + 730 | + 3 890 |
| | 12 | 2 | + 7 540 | — 190 | — | + 240 | — 2 430 |
| E | 1 | 3 | + 5 580 | ± 73 | — 440 | — 460 | — 2 670 |
| | 2 | 3 | + 26 200 | — 50 | + 50 | + 490 | — 730 |
| | 2 | 2 | + 4 860 | + 240 | + 24 | — | — 1 940 |
| | 12 | 3 | + 14 600 | — 220 | + 60 | + 340 | + 2 550 |

* Range of stress : zero of record uncertain.

† Crack inferred within gauge-length : the highest other stress measured was + 580 lb. per square inch.

ø For details of positions see Fig. 9.

TABLE *B.*

**Summary of results of measurements of chair reactions.**

| | Cheddington | Forest Hill | | | | |
|---|---|---|---|---|---|---|
| | Normal service. | Normal service. | Special runs at approx. 60 m. p. h. | | | Normal service. |
| | All steam loco. and tender wheels. | All steam loco. and tender wheels. | Schools class loco., driving wheels only. | Merchant Navy class loco., driving wheels only. | Electric loco., all driving wheels. | Multiple unit electric motor bogie wheels. |
| Average static wheel load . . | | | 10.5 tons | 10.5 tons | 8.3 tons | say 7 tons |
| *Running-on joint sleepers (concrete).* | | | | | | |
| No. of readings . . . . . . | (*a*) | | 12 | 15 | 36 | |
| Average reaction . . . . . . | 8.4 tons | | 27.1 tons | 24.8 tons | 22.2 tons | |
| Range. . . . . . . . . . . | 1 to 22 t. | | 14.5 to 25.3 tons | 18.1 to 30.8 tons | 10.8 to 29.0 tons | |
| Normal (see note below) . . | 5.3 tons | | 24 tons | 25 tons | 23 tons | |
| | | | ESTIMATED | | | |
| *Intermediate sleepers (concrete).* | | | | | | |
| No. of readings . . . . . . | (*b*) | 2594 | 24 | 30 | 72 | 8054 |
| Average reaction . . . . . . | 6.3 tons | 6.8 tons | 8.0 tons | 6.6 tons | 5.7 tons | 7.3 tons |
| Range. . . . . . . . . . . | 1 to 20 t. | 1 to 20 t. | 5.0 to 11.8 tons | 4.7 to 10.3 tons | 2.9 to 15.5 tons | 1 to 20 tons |
| Normal (see note below). . . | 5.0 tons | 5.6 tons | 8.5 tons | 5.5 tons | 5.5 tons | 6.6 tons |
| | | | ESTIMATED | | | |
| | Note: (*a*)+(*b*) represents over 25 000 readings | | | | | |
| *Intermediate sleepers (wood)* . | | | | | | |
| No. of readings. . . . . . . | | 1652 | | | | 4745 |
| Average reaction . . . . . . | | 7.3 tons | | | | 7.4 tons |
| Range. . . . . . . . . . . | | 1 to 20 t. | | | | 1 to 16 t. |
| Normal . . . . . . . . . . | | 5.5 tons | | | | 7.0 tons |

NOTE : The « Normal » chair reaction is that which occurred most frequently. The estimated values for the three types of locomotives, being based on a small number of readings only, cannot be regarded as more than « probable » values.

### (b) *Laboratory tests on concrete sleepers.*

The Southern Region of the British Railways has carried out laboratory bending tests in which chaired sleepers were supported on $^3/_4''$-$^3/_8''$ stone chippings contained in three trays each 2′-6″ long, one tray under each rail and the third under the middle of the sleeper. In order to represent various conditions of packing obtained in the track the load was applied to the outside trays, the middle tray or all three trays as required, the reaction being taken by the chairs. The bend testing machine is shown in figure 10. The following results were obtained from these tests :—

*Test No. 1. — Reinforced concrete sleeper 6″ deep with round bar reinforcement.*

(*a*) A load of 22 tons applied to the outside ballast trays was sustained without cracking.

(*b*) A load of 22 tons of which $^2/_5$ths was applied under each outside tray and $^1/_5$th to the middle tray was sustained without cracking.

(*c*) The load was applied evenly to all three trays and cracks appeared in the top of the sleeper near the centre at a load of 28 tons.

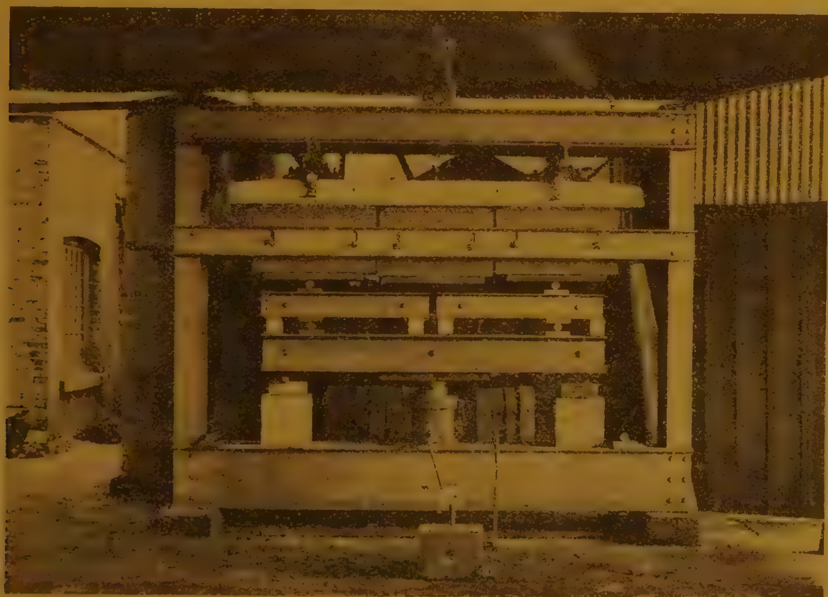


Fig. 10. — Apparatus for testing reinforced concrete sleepers. British Railways.

*Test No. 2. — Sleeper as for test No. 1 but reinforced with « Twisteel » cold-worked reinforcement.*

The load was applied to the outside ballast trays only and cracks appeared under the chairs at a load of 41 tons.

*Test No. 3. — Sleeper as for test No. 2.*

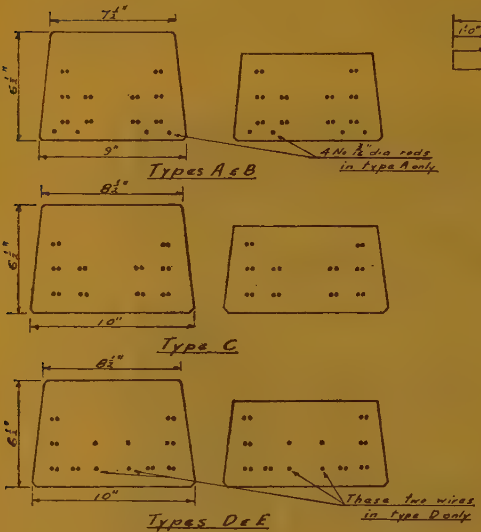
The load was applied evenly to all three trays and cracks appeared in the top of sleeper near the centre at a load of 24 tons. Cracks appeared under the chairs at a load of 41 tons.

*Test No. 4. — Sleeper as for test No. 1.*

The load was applied evenly to all three trays and cracks appeared in the top of the sleeper near the centre at a load of 21 tons. Cracks appeared under the chairs at a load of 28 tons.

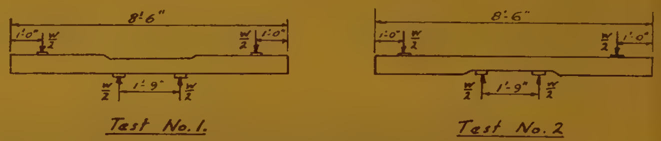
sleeper appeared at a load of 14 tons. Cracks appeared under the chairs at a load of 28 tons.

It was noticed during the above tests that cracks in the sleepers with « Twisteel » reinforcement did not open




*End sections* *Centre sections.*

*Notes.* All sleepers 8′6″ long.
All wires 0·2″ dia.




| *Test No.* | *Type of Sleeper.* | *Sleeper No.* | *Total Load (w) (tons)* | |
|---|---|---|---|---|
| | | | *At first visible crack.* | *At failure.* |
| *1* | *A** | *4* | *4.00* | *7.01* |
| | | *7* | *3.25* | *6.52* |
| | | *15* | *3.00* | *6.43* |
| | *B* | *3* | *3.75* | *5.98* |
| | | *6* | *3.75* | *6.25* |
| | *C* | *2* | *4.75* | *6.65* |
| | | *5* | *4.50* | *8.03* |
| | *D** | *8* | *3.25* | *6.28* |
| | | *10* | *4.00* | *6.74* |
| | *E* | *14* | *4.50* | *7.00* |
| *2* | *B* | *1* | *5.25* | *6.87* |
| | | *9* | *4.25* | *6.20* |
| | *E* | *16* | *4.50* | *6.25* |

** These sleepers were removed from the track for testing.*

*Table of results.*

Fig. 11. — Tests on pre-stressed concrete sleepers. British Railways - Eastern Region.

*Test No. 5. — Reinforced concrete sleeper 7 ½″ deep with round bar reinforcement.*

The load was evenly distributed and tensile cracks near the centre of the sleeper appeared at a load of 31 tons. Cracks appeared under the chairs at a load of 55 tons.

*Test No. 6. — Sleeper as for test No. 5.*

The load was evenly distributed and tensile cracks near the centre of the

up to the same extent as with sleepers reinforced with round bars.

In 1946 the then London and North Eastern Railway carried out tests on pre-stressed concrete sleepers loaded as simply supported beams. Various types of sleepers were tested both right way up and inverted and a summary of the results of these tests is given in figure 11.

(c) *Laboratory tests on concrete blocks.*

In 1942 bending tests were carried out

on concrete blocks by the Eastern Region of the British Railways in which the blocks were simply supported on a span of 1′-8″ and load applied to the chair. Un-reinforced blocks or blocks with only light spiral reinforcement around the chair screw holes cracked at a load of about 3 tons and failed completely after only a small further increase in load. Un-reinforced blocks with chair and fastenings cast on and blocks with welded cage reinforcement cracked at a load of 5-6 tons and failed completely at a load of 10-13 tons. During compression tests on concrete blocks carried out by the same Region blocks without reinforcement or with only light spiral reinforcement around the chair screw holes cracked at 1-1 ½ tons and failed completely at about 2 tons.

Similar tests were carried out by the Southern Region of the British Railways in which the blocks were simply supported on a span of 1′-4″ the load being applied to the chair. In these tests blocks fully reinforced with a welded steel cage cracked at a load of about 10 tons while blocks without reinforcement or only lightly reinforced cracked at a load of 5-8 tons. In all cases vibrated blocks proved slightly stronger than other types. Two fully reinforced blocks supported on stone ballast successfully withstood loads of 23 tons and 34 tons respectively before cracking.

(d) *Laboratory tests on fastenings.*

Tests have been made in order to investigate the relative strengths of various types of fastenings used with concrete sleepers.

In 1943 the Southern Region of the British Railways carried out tests in which chairs were secured to concrete blocks by various means and a force applied to the chair in line with the screws or spikes in order to withdraw them from the block. These tests indicated the general superiority of screws inserted into holes filled with cement mortar over other methods. Such fastenings withstood forces of from 9-11 tons and in some cases the chair broke before the fastenings became loose.

Similar tests were carried out by the Eastern Region of the British Railways in 1942 in which spikes and screws, without chairs, were withdrawn from various types of fixings in concrete blocks. In these tests screws and spikes cast-in or driven into asbestos compound inserts gave better results than screws and spikes driven into wood inserts. Cast-in fastenings were pulled out by forces of 3-4 tons while fastenings with wood inserts failed at 1 ½-2 ½ tons. Only small variations were obtained by using blocks without reinforcement or with spiral reinforcement around the chair screw holes.

### 12. Conclusions.

The use of concrete sleepers and blocks is almost entirely confined to Great Britain and India, and even in these countries their use is very limited and still largely in the experimental stages. Such experiments have been undertaken through force of circumstances and not from choice, and concrete sleepers are not considered to be entirely suited to permanent way. Although static load tests may produce satisfactory results the behaviour of concrete sleepers under fast traffic is not yet entirely satisfactory and for this reason their use is still generally restricted to sidings and minor running lines. Further disadvantages lie in the fact that a higher standard of packing is generally required with concrete sleepers and their weight presents considerable difficulty when laying-in.

Various combinations of through-sleepers and blocks have been used, but in main lines, continuous sleepered track is the only type which has given

satisfactory results. Concrete blocks with steel gauge ties have been used in sidings and minor running lines without failure and this type appears to present the most economical method of overcoming the present restrictions placed on supplies of normal sleepers.

Although the use of concrete blocks on track-circuited lines is reported it seems certain that the large scale use of concrete sleepers as at present designed is not practicable on track-circuited or electrified lines where the return current is through the running rails.

Pre-stressed concrete sleepers have given far better results in running lines than those with conventional reinforcement and it is likely that future developments will be concentrated upon this type.

## APPENDIX A.

### Extracts from British Standard Specification 986 : 1945.

*General.*

Scope.

1. This specification provides for sleepers for standard 4 ft. 8 ½ in. gauge railway tracks, of the following classes, namely :

Class A for lightly worked and storage sidings;

Class B for heavily worked and refuge sidings, goods loops and the like, over which the speed is limited to 30 m.p.h.;

Class C for tertiary tracks;

Class D for secondary tracks;

Class E for primary tracks.

In each class the following different types are provided for, except that for classes C, D and E transverse sleepers only shall be used :

For F. B. rails :

(*a*) Transverse sleepers.

(*b*) Block sleepers connected by tie bars.

(*c*) Block sleepers unconnected by tie bars.

For B. H. rails :

(*d*) Transverse sleepers.

(*e*) Block sleepers connected by tie bars.

(*f*) Block sleepers unconnected by tie bars.

Arrangement of sleepers.

2. Where unconnected block sleepers are used, transverse or connected block sleepers shall be provided to hold the rails to gauge in the proportion of not less than one transverse or connected-block sleeper to three pairs of unconnected-block sleepers.

*Materials.*

Steel.

3. The steel reinforcement for ordinary reinforced concrete sleepers shall comply with the requirements of B.S.785.

The steel reinforcement for pre-stressed concrete sleepers shall consist of either :

(i) hard drawn wire of a diameter not exceeding $^1/_6$ in. with an ultimate tensile stress of between 80 and 125 tons per sq. in. and having a permanent set not exceeding 0.1 per cent of the length of the wire after being subjected to a load of not less than 70 per cent of the ultimate tensile stress, determined by slow loading and measurement with a precision extensometer or by using long lengths of wire at the works where the sleepers are being manufactured, or :

(ii) alloy steel with an ultimate tensile stress of at least 70 tons per sq. in. and of diameter not greater than $^3/_8$ in.

All reinforcement shall be free from loose mill scale, loose rust, oil, soap and grease, or other deleterious material, immediately before placing the concrete.

When wires for pre-stressed concrete

sleepers are obtained in coils, they shall be mechanically straightened preferably before being put in the stretching device.

### Cement.

4. The cement for ordinary reinforced concrete sleepers shall comply with the requirements of one of the following British Standards :

B.S.12. Portland cement.

B.S.146. Portland blast-furnace cement.

The cement for pre-stressed concrete sleepers shall consist of rapid hardening Portland cement complying with B.S.12 with the extra provision that the initial setting time shall be not less than one and a half hours.

### Concrete.

6. The concrete shall have a nominal mix of 1 : 1 ½ : 3 with a test cube strength at 28 days of 5 000 lbs. per sq. in. for ordinary reinforced concrete sleepers and 6 000 lbs. per sq. in. for pre-stressed concrete sleepers.

## *Design.*

### Dimensions.

7. (*a*) The overall length of transverse sleepers shall be not less than :

8 ft. 0 in. for class A, and

8 ft. 3 in. for other classes.

The length of block sleepers shall be not more than 3 ft. 4 in., and the longest dimension shall be transverse to the rail.

(*b*) The bearing area under each rail, in the case of a transverse sleeper, is the area included within the length 2x shown in figure 1; in the case of a block sleeper, the bearing area is the whole area of the base. In each case the bearing area includes the projection of the bevel or radius of bottom edge in contact with the ballast.

The bearing area to be provided for transverse sleepers, and for block sleepers of classes A and B, shall be not less than the following :

Class A : 360 sq. in.

Class B and intermediate sleepers of classes C, D and E : 400 sq. in.

| | |
|---|---|
| Joint sleepers of classes C and D : 440 sq. in.<br>Joint sleepers of class E : 480 sq. in. | Where special joint sleepers are required. |

(*c*) Class A sleepers for F.B. rails shall ordinarily provide for a flat rail seat, and class B sleepers for a rail seat canted to an angle of 1 in 20, unless otherwise specifically required by the purchaser. For sleepers of classes C, D and E a canted rail seat on the sleeper is unnecessary as sole plates will be used which provide the cant required.

(*d*) All corners which may be damaged during packing of the track shall have a radius of not less than ½ in. or, alternatively, shall have a bevel of not less than ³/₈ in.

(*e*) Sleepers shall have a depth of not more than 5 ½ in. in the case of class A, 6 in. in the case of class B and 6 ½ in. for other classes. The depth of the joint sleeper shall not exceed that of the intermediate sleepers in the same track by more than ¼ in.

(*f*) The average width of a sleeper shall not at any section be less than the depth at the rail seat (without allowance for canting in sleepers of classes A and B) plus 1 in., excluding any reductions made under sub-section (*d*) and by the recesses for lifting tongs.

The increased bearing area of joint sleepers shall be obtained by increasing the width and not the length.

(*g*) The cross-section in the central portion of the sleeper shall not be reduced by means of a slot in the case of sleepers in classes C, D and E. Where a slot is used in sleepers of classes A and B it shall be not more than 2 in. wide at the upper surface.

## Design loading.

8. (*a*) The load transmitted by each rail, including the necessary allowance for impact, shall be taken to have the value given in table 2.

TABLE 2.

| Class of sleeper | Type of Track | Chair reaction R in tons for : | | | |
|---|---|---|---|---|---|
| | | Normal reinforced concrete sleepers | | Pre-stessed concrete sleepers | |
| | | Intermediate sleepers | Joint sleepers | For design at section under rail | For design at centre of sleeper |
| A | Lightly worked sidings . . . | 5.5 | 5.5 | 9 | 5.5 |
| B | Heavily worked sidings and refuge sidings, goods loops and the like, over which the speed is limited to 30 mph. | 7.5 | 7.5 | 12.5 | 7.5 |
| C | Tertiary . . . . . . . . . . | 9 | 10 | 15 | 10 |
| D | Secondary . . . . . . . . . | 10 | 12 | 20 | 12.5 |
| E | Primary . . . . . . . . . . | 11 | 14 | 22 | 15 |

(*b*) The pressure intensity of the ballast reaction under a transverse sleeper shall be taken to be as shown in figure 1.

Under block sleepers the pressure intensity shall be taken to be uniform over the whole of the bearing area, the centroid of which shall coincide with the centre of applied pressure as shown in figure 1.

(c) The pressure between the rail, sole plate or chair and the sleeper shall be assumed to be uniformly distributed over a length (*y* in fig. 1) equal to the width of the flange of the rail or the length of the sole plate or chair.

(*d*) The design of the centre portion of transverse sleepers shall be such that they will be able to resist a positive or negative moment equal to not less than 30 000 in. lb. in the case of class A and class B, and 45 000 in. lb. in the case of classes C, D and E.

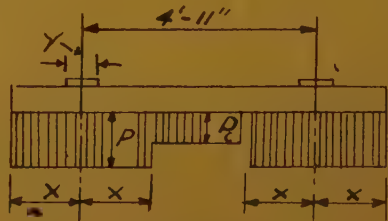



Fig. 1. — Distribution of pressure under sleepers.

For class A, B or C sleepers Pc = P/2.
For class D sleepers Pc = P/3.
For class E sleepers, Pc = P/4 except that for sleepers to be used in tracks with ash ballast, Pc = P/3.

(*e*) Block sleepers connected by a permanent tie shall be designed as independent block sleepers and the tie shall be designed to resist a bending moment of not less than 6 000 in. lb. The embedment of the tie in the sleepers shall be such that this bending moment can be developed and that the embedment shall be capable of resisting an axial pull of not less than 3 tons.

*Clauses applicable to sleepers of normal reinforced concrete.*

Permissible stresses.

9. (*a*) The compressive bending stress in the concrete shall not exceed 1 200 lb. per sq. in. Where the sum of the diameters of the holes or inserts for the fastenings in any one cross-section does not exceed 2 in., the area of such holes or inserts shall not be deducted in computing the compressive stress. Where the sum of the diameters of the holes or inserts in any one section exceeds 2 in. the excess above 2 in. shall be deducted.

(*b*) The tensile stress in the reinforcement shall not exceed 18 000 lb. per sq. in. No increase in stress shall be permitted if high tensile steel is used.

The compressive stress in the reinforcement shall not exceed fifteen times the compressive stress in the surrounding concrete.

(*c*) The modular ratio shall be taken as 15.

(*d*) For the purposes of calculation, the area of the compressive steel at any one section shall not be taken to be greater than that of the tensile steel at the same section.

Bond and anchorage.

10. Adequate provision shall be made to ensure that the longitudinal stresses in the reinforcement can be developed by bond, together with hooking, welding or other means. Reliance shall not be placed on bond alone.

Cover.

11. A cover of not less than ½ in. of concrete shall be maintained over *all* reinforcement, including links or stirrups.

Cranking of bars.

12. The cranking of bars in the horizontal plane shall not exceed a slope of 1 in 6 and links, which should preferably be welded, shall be provided to resist the outward bursting stress on the concrete.

*Clauses applicable to sleepers of plain concrete.*

Block sleepers.

13. Block sleepers of plain concrete shall be so proportioned that the load can be transmitted through the sleepers to the ballast over the full area of the base of sleeper. For the purpose of this clause the load shall be assumed to be dispersed from the area of contact of the rail or chair at an angle of 45° to the vertical.

*Clauses applicable to pre-stressed concrete sleepers.*

Permissible stresses.

14. (*a*) For the preliminary stretching of the reinforcement the tensile stresses shall not exceed 65 per cent of the ultimate stress for hard drawn wires, and 85 per cent of the elastic limit for alloy steel.

(*b*) The final working stress of the reinforcement shall not exceed 60 per cent of the ultimate tensile stress after allowance has been made for the losses defined in sub-section (*e*) below.

(*c*) The final working stresses in the concrete shall not exceed :

(i) Compressive bending stress 3 000 lb. per sq. in.

(ii) Tensile bending stress, 300 lb. per sq. in.

(iii) Principal tensile stress, at the

section of maximum shear, 150 lb. per sq. in.

(*d*) For the purposes of calculation the modulus of elasticity of the reinforcement may be taken as $28 \times 10^6$ lb. per sq. in. and the modular ratio shall be taken as 7.0. The whole section shall be regarded as homogeneous and the distribution of bending stress across any section shall be assumed to be linear. When calculating the initial stresses due to pre-compression of the concrete, the concrete cross-section only shall be taken into account.

(*e*) The losses of pre-stress in the steel shall be calculated on the basis of the following assumptions :

(i) The elastic strain of the concrete is equal to $0.25 \times 10^{-6}$ per lb. per sq. in.

(ii) Creep of the concrete is equal to $0.3 \times 10^{-6}$ per unit length per lb. per sq. in.

(iii) Shrinkage of the concrete is equal to $300 \times 10^{-6}$ per unit length.

Bond and anchorage.

15. Adequate provision shall be made to ensure that the longitudinal stresses in the reinforcement can be developed. No special anchorage device need, however, be provided for wires of diameters not exceeding $^1/_5$ in.

Cover and spacing of bars.

16. (*a*) A cover of not less than 1 in. of concrete shall be maintained over the main reinforcing wires.

(*b*) The distance between wires (centre to centre) shall be not less than $\frac{3}{8}$ in., except that if the wires do not exceed $^1/_5$ in. in diameter they may be arranged in pairs with a distance between pairs (centre to centre) of not less than $1\frac{1}{4}$ in.

Pre-stressing and release of wires.

17. (*a*) The necessary elongation of the reinforcement shall be directly determined by measuring the stretching force and elongation when the reinforcement is in position prior to concreting. The fixing of the stretched reinforcement shall be such that no slipping occurs during manufacture and until the wires are released.

(*b*) The stretched wires shall not be released until the cube strength of the concrete has attained a value of at least 4 000 lb. per sq. in.

(*c*) When releasing the wires, measurements of the contraction shall be made and compared with that calculated in the design of the sleepers. If the contraction is excessive the sleepers shall be rejected. In the case of doubt the test in Appendix C shall be applied, and if the sample sleeper fails to comply with the test, the batch of sleepers shall be rejected.

*Clauses applicable to the manufacture of both pre-stressed and normal reinforced concrete sleepers.*

Mixing of concrete.

18. The concrete shall be mixed in an approved mechanical mixer. The slump shall be 1 in. with a tolerance of $\pm \frac{1}{2}$ in., measured in accordance with the standard slump test given in B.S.449, Appendix L.

Neither what is generally known as the semi-dry process, nor a process of instant de-moulding shall be used. The sleeper shall not be removed from the mould until after the final set has taken place.

Consolidating.

19. The concrete shall be fully consolidated by vibration, or by other means approved by the purchaser.

Curing.

21. (*a*) Concrete after being placed in the moulds shall be protected during the first stage of hardening from the harmful effects of sunshine, drying winds, cold and rain.

(*b*) Sleepers shall not be de-moulded earlier than 12 hours after completion of concreting, and shall be handled in such a fashion as not to jar the sleepers.

(*c*) For at least seven days the concrete shall be prevented from drying out too rapidly by being sprayed with clean fresh water and/or covered with a layer of suitable material kept in a damp state.

(*d*) Recourse may be had to steam curing subject to the temperatures, pressures and time intervals being approved by the purchaser.

Pads.

27. Pads under chairs, sole plates or F.B. rails need not be provided for class A sleepers, but are recommended for class B sleepers, and shall be provided for sleepers of classes C, D and E. When used, pads shall be of either (*a*) hardwood not less than $^3/_8$ in. thick, or (*b*) tarred or bitumen felt not less than $^1/_8$ in. thick before being compressed. The pads shall be pre-holed or slotted as may be necessary to suit the positions of the bolts, screws or spikes used.

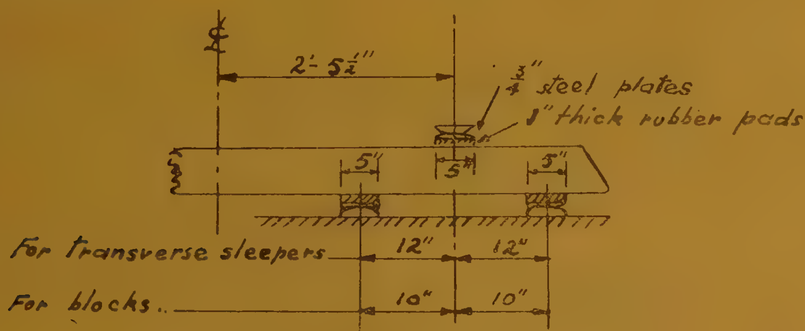



Fig. 2.

Fastenings.

26. Clips. Class A sleepers for F.B. rails shall ordinarily be fastened by mushroom-headed coach screws or bolts directly bearing on the rail flange without the use of clips with the rails spaced to give 4 ft. 8 ½ in. gauge without provision for additional slack gauging on curves. Class B sleepers shall, however, be provided with clips arranged to give a gauge variable from 4 ft. 8 ½ in. to 4 ft. 9 in., the clips being of the form shown in figure 8 or approved modifications of same.

Sleepers of classes C, D and E for F.B. rails shall be fitted with sole plates and clips of an approved design.

Sleepers for B.H. rail shall be fitted with chairs of an approved design preferably with a two-bolt fixing.

*Check test*
*on normal reinforced concrete sleepers.*

When required by the purchaser, sample sleepers selected from the bulk by the purchaser shall be subjected to the following bending test :

A concentrated load at the centre of a 24-in. span in the case of transverse sleepers, or a 20-in. span in the case of block sleepers, shall be applied. The load applied shall be sufficient to produce a bending tensile stress of 500 lb. per sq. in. at the extreme fibre of the concrete, the moment of resistance being calculated on the concrete alone, neglecting the reinforcement. At each position of loading and support, rubber pads shall be interposed between the sleeper and the loading blocks which shall be rounded so as to locate the

loading at the centre of the pad (see fig. 2).

If hair cracks appear in the sleeper at this or a lesser load, the batch of sleepers of which the sleeper tested is a sample may be rejected.

For the purpose of this test, the load referred to above shall have a value of :

W = 93 Z for transverse sleepers, or

W = 114 Z for block sleepers,

where W is the load in lb. and Z is the section modulus of the sleeper at the section beneath the load, in (inch)$^3$, neglecting the reinforcement.

*Check test*
*on pre-stressed concrete sleepers.*

When required, a sample sleeper shall be loaded as shown in figure 3. At each position of loading or support, rubber pads 1 in. thick shall be interposed between the sleeper and the loading plates.

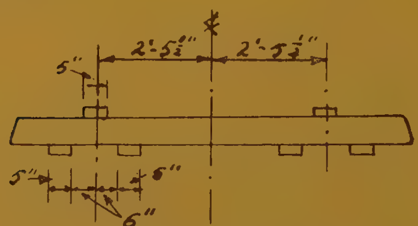



Fig. 3.

The sleeper shall be considered satisfactory if no hair cracks have appeared when the following load is applied at each end :

| | | |
|---|---|---|
| Class A sleepers | | 15 tons |
| » | B » | 15 tons |
| » | C » | 20 tons |
| » | D » | 25 tons |
| » | E » | 30 tons |

If hair cracks appear in the sleeper at a lesser load, the batch of sleepers of which the sleeper tested is a sample shall be rejected.

## APPENDIX B.

### Summary of tests to determine the path of leakage current.

These tests were carried out by the Southern Region of the British Railways.

Preliminary measurements made on existing concrete and timber sleepered track indicated that the electrical resistance from rail to earth of the former was about $^2/_3$rds. that of the latter and as a result it was not considered advisable to use concrete sleepers where track-circuits or electric traction was installed.

In order to obtain more precise information, a length of dummy track with various types of sleepers and fastenings was laid on a depth of 18 inches of clean ballast. Wood pads were used between chairs and concrete sleepers. The electrical resistance from rail to rail was measured under dry and wet conditions. Under dry conditions the readings were too high to be of value and under wet conditions the resistances were, on the average, in the following proportions :—

| | |
|---|---|
| Reinforced concrete sleeper with through bolts . . . . . . . . | 1 |
| Pre-stressed concrete sleeper with through bolts . . . . . . . . | 4 |
| Reinforced concrete sleeper with spikes and trenails . . . . . . | 6 |
| Timber sleepers with through bolts | 12 |
| Timber sleepers with chairscrews . | 24 |

From a detailed analysis of the results it appeared that about 50 % of the leakage took place between the underside of the bolts and that a considerable amount of leakage took place through the body of the concrete. In order to determine the probable path of the leakage current pre-stressed concrete sleepers with the exposed ends of the pre-stressing wires sealed up were supported on insulated blocks. The rails, keys, wood pads and ballast were dispensed with. The electrical resistance

between the chairs or bolts was measured for various arrangements of fastenings and the results obtained are given in the following table :—

| Arrangement | Assumed path of leakage | Ratios of measured resistance | |
|---|---|---|---|
| | | Damp | Wet |
| (*a*) Chairs resting on sleepers. | Major leakage over top surface, minor leakage over bottom surface and through body of concrete via the chairs . . . . . . . . . . . . . . | 14 | 10 |
| (*b*) Chairs bolted on | Over top and bottom surfaces and through body of concrete via bolt shanks and chairs . . . . . . . . | 7.5 | 6 |
| (*c*) Chairs removed, bolts replaced with nuts and bolts heads insulated | Through body of concrete via bolt shanks. . . . . . . . . . . . . . | 80 | 40 |
| (*d*) Holes enlarged, chairs bolted on with bolt shanks clear of concrete. | Major leakage over top and bottom surfaces, minor leakage through body of concrete via the chairs . . . . . | 10 | 10 |

The fact that $\frac{1}{R_c}$ plus $\frac{1}{R_d}$ agrees fairly well with $\frac{1}{R_b}$ shows that the results are reasonably consistent.

The magnitude of $R_c$ compared with $R_d$ suggested that further research should have the object of reducing surface leakage rather than leakage through the body of the concrete.

Tests were also made on reinforced concrete blocks both painted and impregnated with bituminous emulsion but it was found that under wet conditions the resistance showed excessive fluctuation and the mechanical strength of the concrete appeared to be impaired.

# c) Recovery and strengthening of metal bridges that have reached the theoretical limit of safety.

TABLE OF CONTENTS



## 1. Scope of report.

This report is concerned only with metal bridges carrying railways over roads, rivers, other railways and similar gaps. Its purpose is to summarise and compare within these limits the various methods adopted by railways in America, Great Britain, Dominions, Protectorates and Colonies, China, Egypt and India for assessing the strength of existing bridges and for strengthening bridges which have reached the theoretical limit of safety, with particular reference to bridges which, having reached this limit, have been removed either in one piece or by dismantling, strengthened in a workshop or elsewhere and re-used at the same or some other site. Only recent and present-day practice is considered and examples of the recovery and reinforcement of metal spans which have occurred many years ago are not included.

## 2. Source of information.

In June, 1948 a questionnaire was sent to 30 Railway Organisations in the countries listed above. Sixteen railways replied to this questionnaire and a list is given in Table I, together with the number of spans maintained by each railway and the total tonnages of metal involved. This report is based on the procedure adopted by those railways answering the questionnaire.

TABLE I

**Railways replying to questionnaire and No. of bridge spans maintained.**

| Railway | No. of bridges or spans | Total weight of metal involved in tons |
|---|---|---|
| Sudan Railways | 2 600 spans | 13 000 |
| Ceylon Government Railways | 1 100 » | 27 000 |
| East African Railways | 260 » | 13 000 |
| South African Railways | 25 000 » | 400 000 |
| Indian Government Railways | 4 400 » (*) | 705 000 (*) |
| New Zealand Government Railways | 6 500 » | 85 000 |
| Victorian Government Railway, Australia | 4 500 » | 100 000 |
| Bessemer and Lake Erie Railroad | 300 » | 23 000 |
| Pennsylvania and Long Island Railroad | 4 616 bridges | — |
| London Transport Executive | 222 » | 17 000 |
| British Railways :— | | |
| Scottish Region | 6 830 spans | 203 000 |
| Eastern Region | 2 000 bridges | — |
| Western Region | 6 250 spans | 190 000 |
| North Eastern Region | 1 711 » | 67 000 |
| London Midland Region | 6 400 » | 130 000 |
| Southern Region | 4 000 » | 150 000 |

(*) Excluding narrow gauge bridges.

NOTE : The above figures refer only to metal underline bridges.

### 3. Reasons for investigating the strength of existing bridges.

The strength of bridges is investigated when excessive corrosion is reported after a periodic inspection, when the load capacity of the line is to be increased or in the rare event of damage being caused to the structure. No railway reports any other procedure.

### 4. Methods of assessing the strength of existing bridges.

In order to determine whether or not an existing bridge has reached the theoretical limit of safety, all railways answering the questionnaire adopt the procedure of calculating the stresses in each member of the bridge when it is traversed by an actual or assumed live load. In some cases, these calculations are verified by actual measurement using strain gauges, particularly where design assumptions may not be fully realised in practice. It is usual to allow stresses in existing bridges somewhat higher than those accepted for the design of new structures and the reason given for this is that new bridges are designed with a view to long life and low maintenance costs. However, the live load and stresses adopted vary and the different methods are best described by considering each country in turn.

(a) *Great Britain.*

Assessment is made by calculation and strain gauges are only used when the design assumptions are in doubt or the calculated stresses approach the allowable values. Electric strain gauges are sometimes used but those most frequently adopted are the Fereday-Palmer and the Cambridge Stress Recorders. These measure the strain on a 10 inch gauge length but are somewhat cumbersome to use. It is considered likely that electric strain gauges will be used in the future. Where the test load is less than that required to operate over the bridge the measured live load stresses are increased in direct proportion to the loads. Generally it is found that measured stresses are lower than those calculated and this is attributed to the fact that the rigidity of the deck system often adds to the strength of the bridge and also to the fact that rivetted joints produce end-fixity and beam-continuity to a degree difficult to assess when making calculations. It is not usual to adopt measured stresses in favour of calculated stresses, but each case is considered on its own merits.

Design assumptions at the present time vary somewhat from Region to Region on the British Railways but when calculating the stresses in existing bridge members, it is usual to adopt British Standard Specifications. These lay down recommendations for working stresses, equivalent length of compression members, etc. The Static Live Load is also adopted from these Specifications and this consists of a Standard Unit Train (see fig. 1). A multiple of this unit loading is used according to the classification of the line. Tables are given for maximum bending moments and shear forces for varying lengths of span.

In order to determine a suitable allowance for impact, the British Bridge Stress Committee, sponsored by the four main line railways of Great Britain, carried out dynamic tests on various types of bridges in 1927. As a result it was recommended that bridges should be designed for any one of the following groups :—

A — 20 units static load with 5.0 tons hammer blow at 5 revs. per sec.

B — 16 units static load with 12.5 tons hammer blow at 5 revs. per sec.

C — 15 units static load with 15.0 tons hammer blow at 5 revs. per sec.

Tables were worked out giving the equivalent uniformly distributed load for each group on varying spans and including also allowances for rail-joint effect and lurching.

Each locomotive is classified in its appropriate group.

In actual fact, it is usual to determine the stresses in certain existing bridges by adopting some proportion of these loadings sufficient to cover the locomotives required to operate over the bridge.

The Bessemer and Lake Erie Railroad determine the Cooper Loading (see fig. 2) that may be used without exceeding the allowable stresses, (which may exceed by 25 % those adopted for new bridges). The Pennsylvania Railroad calculates the dead and static live load stresses from tables giving bending moments and shear forces for the particular engine required to operate over the bridge and a permissive speed is determined from the stress remaining. If such a speed is less than 10 miles per

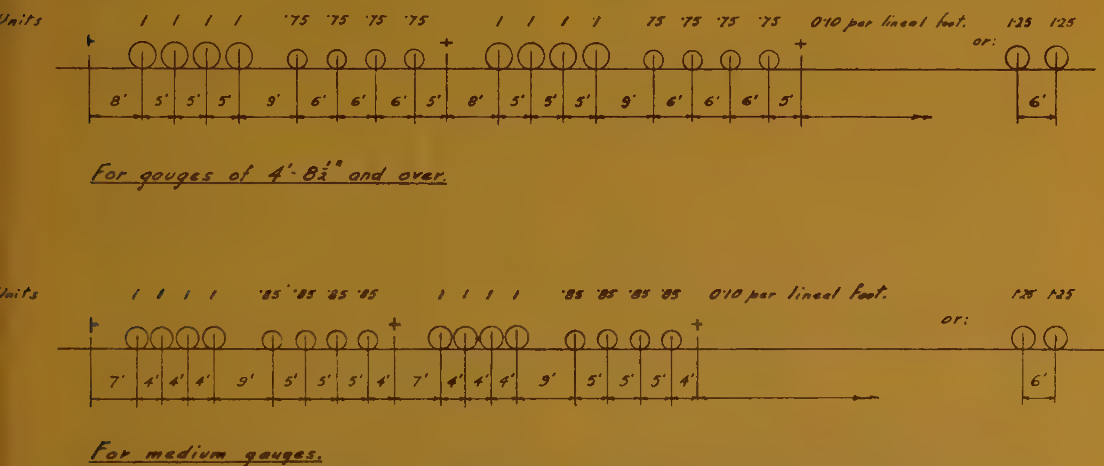



Fig. 1. — British Standard Unit Loadings for railway bridges for one line of way.

hour, the operation of the locomotive is prohibited. This Railroad reports that measured stresses are usually less than those calculated.

(b) *United States of America.*

The American Railway Engineering Association has drawn up a Specification for assessing the strength of existing bridges including allowances for impact. The stress allowed is 33 % above that for new bridges which is 18 000 lbs. per sq. inch. Many railways have, however, drawn up their own Specification. When the calculated stresses approache the allowable value, electric strain gauges with oscillograph recording are used to measure the actual stresses produced by the heaviest load required to operate over the bridge.

(c) *Australia.*

No strain gauges are used and bridges are assessed by calculation, using Coopers E.40 or E.55 loading (see fig. 2) according to the classification of the line and for existing bridges 80 % of the yield stress is adopted as the allowable stress. Allowance for impact is made in accordance with the British Bridge Stress Committee's Report, except

for new bridges when the A. R. E. A. specification is adopted.

### (d) *East Africa.*

Assessment is made by calculation and no strain gauges are used. The live load adopted is 18 Units of the British Standard Loading for Medium Gauge bridges with an impact allowance calculated from the formula :—

$I = \frac{120}{90 + L}$ where $L$ = effective span in feet.

This allowance is reduced by 25 % for spans less than 60 feet.

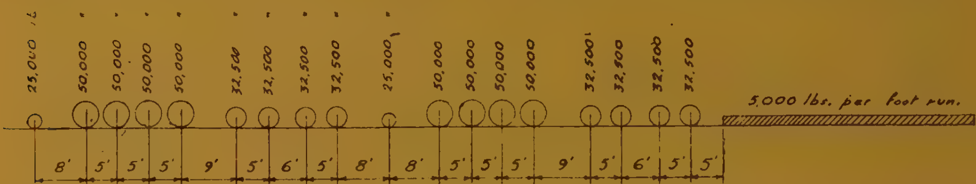



Fig. 2. — Cooper E.50 Loading for railway bridges for one line of way.
*Note.* — Other Cooper Loadings are directly proportional to the loads given above. (e.g. E.40 Loading = $^4/_5$ths. of E.50 Loading.)

### (e) *South Africa.*

Regulations are laid down by the State Transport Authority and based on British Standard Specifications. Impact allowance is made in accordance with the British Bridge Stress Committee's Report. Electric strain gauges are used and when assessing the strength of an existing bridge, measured stresses may be accepted as correct where they differ from calculated stresses.

### (f) *Ceylon.*

Regulations are laid down by the Crown Agents for the Colonies, and assessment is made by calculations, adopting conventional methods. No strain gauges are used at the present time but they are to be adopted in the future. The live load adopted is the British Standard Loading and the Units for each line are as follows :—

| | |
|---|---|
| Main lines . . . | 21 Units |
| Branch lines . . | 12.5 » |
| Light railways . | 9.3 » |

No details are provided of allowances made for impact but it is assumed that this follows the British practice.

### (g) *Sudan.*

The Sudan Railway uses stock spans in the majority of cases and their strength is verified by calculation. The live load adopted is the heaviest engine required to use the bridge, double-headed. Strain gauges are used and measured stresses have not been found to differ greatly from those calculated.

### (h) *India.*

Bridge Rules and Steel Bridge Code are issued by the Ministry of Railways.

In assessing the capacity of existing bridges the live load adopted is the same as for new bridges and consists of Standard Train loads varying with the gauge and classification of the line. Where bridges are found to be beyond the limit of safety for the appropriate Standard Train Load travelling at maximum operating speed, a speed restriction is imposed and the bridge brought within this limit by reducing the impact allowance in direct proportion to reduction in speed. In the case of plate

girders the maximum permissible operating speed is 60 m.p.h. for Broad Gauge and 45 m.p.h. for Metre Gauge track. In the case of lattice girders the maximum permissible operating speed is that speed giving maximum deflection or is calculated from the maximum static deflection using an empirical formula. Where no rail joint occurs on the bridge, the impact factor may be reduced by an amount equal to $\frac{2.5}{\text{span in feet}}$ with a maximum reduction of 20 %. In no case is the impact factor allowed to be less than 0.1.

Tensile and compressive stresses allowed in existing bridges with lattice girder spans may be 5 % higher than for new bridges and shear and bearing stresses in rivets may be 10 % higher. For other types the tensile and compressive stresses may be increased by 11 % and rivet stresses by 25 % unless allowance is made for the frictional resistance of the rivets, in which case no such increase is permitted.

In a few cases direct measurements are made using Fereday-Palmer stress recorders and optical deflectometers to supplement calculations. When, as is usual, the live load used for such measurements is less than the load required to operate over the bridge the measured live load stresses are increased in direct proportion of the loads. The measured stresses are usually found to be less than those calculated and provided there is no great discrepancy between the two the calculated stresses are accepted as correct.

## 5. Exceptional loads.

When determining whether or not a bridge has reached the theoretical limit of safety, it is the practice of all railways to adopt for this purpose a live load which will include the heaviest normal traffic load, but circumstances may occur where a bridge is found to be within this limit for these loads but beyond it for infrequent exceptional loads such as may occur during the clearance of train wrecks and the transport of such objects as transformers and heavy castings. Although each case is usually considered upon its own merits, yet it is the practice of the majority of railways replying to the questionnaire to permit such loads at dead slow speeds in order to reduce the impact effect and the allowable stress is increased by varying amounts. The Australian Railways may allow the stress to be increased up to the yield stress while the South African Railways and Indian Railways may allow a 25 % increase. The Eastern Region of the British Railways allows a 10 % increase, although sometimes where even heavier loads cannot be avoided in cases of emergency, the stress may be allowed to approach the yield stress except in the case of tension in cast iron when no more than a 10 % increase is allowed. Other railways permit such exceptional loads but do not state any fixed increase in the allowable stress.

## 6. Methods of dealing with weak bridges.

Bridges that have reached the theoretical limit of safety as determined by the respective methods previously described may be dealt with in any one of the following ways :—

(*a*) complete renewal,

(*b*) strengthening in-situ,

(*c*) recovery and subsequent re-use.

The replies from railways in answer to the questionnaire stress the fact that each case is dealt with on its own merits but the following observations may be made.

All these railways adopt method (*a*) in the vast majority of cases except the Sudan Railway where bridges so far have not required any major attention. In Great Britain most of the bridges

were built about the middle of the last century with a considerable margin of safety which has allowed corrosion to occur without causing them to pass the theoretical limit of safety in spite of increasing loads and speeds. When, however, they do reach this limit the great age of the bridges and the extent of the corrosion make salvage or strengthening for even higher loads to be used in the future quite uneconomical. This fact is also applicable to many bridges in Australia and the U. S. A. This state of affairs will be more readily appreciated when it is remembered that stresses allowed in old existing bridges may be up to 33 % greater than those stipulated by later regulations for new bridges as mentioned earlier in this report. Thus strengthening is often not possible and in many cases where method (*b*) could be adopted it is found that heavy costs due to dislocation of traffic and temporary works are incurred, or else it is desired to improve the layout by increasing the number of tracks, improving the highway clearance or to improve the design of the bridge (e.g. by providing a ballasted deck) and therefore method (*a*) is preferred. The fact that renewal will provide a bridge with a greater load capacity, longer life and less maintenance costs is also largely responsible for this preference. In Australia, in the case of bridges spanning over rivers it has been found more economical to construct intermediate supports rather than strengthen the girders provided that the navigational channel is not impeded thereby. Similar examples have occurred in other countries. On the North Eastern Region of the British Railways it is unusual to embark on a large strengthening scheme if the renewal of the bridge is envisaged within the next 20 years or so and other methods, such as load or speed restrictions, are adopted in order that the heavy strengthening cost may be avoided until such renewal is necessary.

However, where the cost of strengthening has been justifiable nearly all the railways have strengthened several bridges in-situ in a variety of ways both in the case of corroded members and where heavier loads were required to operate over the bridge. The Indian Railways report that strengthening in-situ is usually only undertaken where it is possible and economical to strengthen the bridge to the same capacity which would be obtained from a new bridge. The Western Region of the British Railways state that strengthening in-situ is usually undertaken where the cost is less than 45 % of that of a new bridge.

The vast majority of the railways have, to varying degrees, removed existing spans and either re-used them immediately at some other site or kept them in store with a view to their re-use in the future as circumstances may occur. Generally speaking this is only possible where lines have been re-classified, singled or abandoned but occasionally girders which have become too weak for existing lines have been re-used. Displaced girders have been used un-changed on lines of lower classification but the most favoured methods are to reduce the span or to increase the number of girders per track in order to provide greater strength. It is unusual to strengthen displaced girders by replating, etc. In East Africa the allowable axle load on the main line from Mombassa to Nairobi was increased to 18 tons. A certain number of new spans were provided and the girders thus displaced used to increase the number of girders per track on other bridges on the same line in order to provide for this increased load. In one or two cases bridges were replaced by embankments and culverts and the displaced spans re-used. On the Cape-Western line in South Africa during its re-classification nearly all the bridges were replaced by new and stronger structures and the displaced girders stored for re-use on branch lines carrying lighter traffic. In

Great Britain, the U. S. A. and Australia bridges removed from re-classified, singled or abandoned lines have been re-used un-changed on branch or secondary lines but more often the load capacity of girders so displaced has been increased by shortening the span or by increasing the number of girders per track and then re-used either on lines of similar classification or on secondary lines. The Pennsylvania Railroad reports that while in the past displaced bridges have been re-used on secondary lines un-changed the classification of such lines has now been increased to such an extent as to make this procedure impossible. The London Transport Executive reports that the density of its traffic allows only short possession periods and consequently in the few cases where a bridge to be replaced may be re-usable this is rendered impossible by the fact that more often than not it must be cut into small sections to facilitate its removal. Where the procedure of re-using displaced spans as outlined above is adopted its use is almost entirely confined to short or medium span bridges of the deck plate girder type. These present few problems in transport and are more easily adapted to suit other sites. Medium span lattice girders usually require costly methods of removal, transport and re-erection and in any case their use for rail bridges has fallen into disfavour. A few recent examples of the re-use of displaced girders are given later in this report.

The only examples of girders being removed, repaired and re-used on a programmed basis at the same or at other sites on lines having the same classification are given by the Southern Region of the British Railways and by the Indian Railways. The Southern Region repaired way-beams in the workshops and re-used them at the same sites and details are given in Examples Nos. 8 and 9 following. The Indian Railways repaired 40′ stock span girders and re-used them at other similar sites and details are given in Example No. 10.

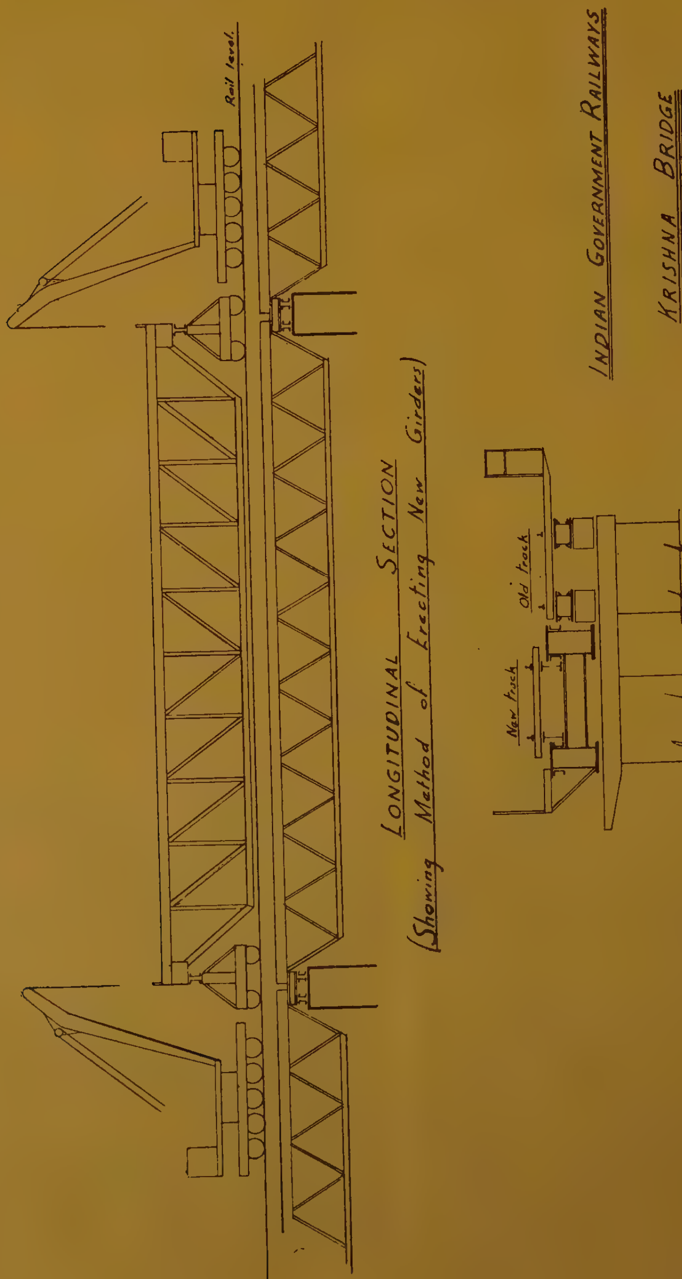
**7. Examples of the re-use of displaced girders.**

*Example No. 1.*

The Indian Railways quote the example of the Krishna Bridge which consists of 36 No. 100-ft. spans of wrought iron, underslung Warren girders. The bridge carries a single track and was restricted to a maximum axle load of 15-tons at 10 miles per hour. The existing girders were replaced by 150-ft. span Warren and Pratt type girders some of steel and some of wrought iron, which had been released from other locations and converted to 100-ft. span underslung trusses in the railway workshops. The existing girders were positioned on one side of the piers and abutments which had originally been designed for a double track bridge. The reconditioned girders were mounted on rail trollies at each end and wheeled out along the existing track. They were lifted into position alongside the existing girders by two hand cranes working on the existing track. When the new bridge had been completed the old girders were removed in a similar manner, the rail trollies and hand cranes working on the new track. Finally the new girders and track were slued into a position central on the piers by means of jacks. The new girders weighed approximately 30 tons each (see figs. 3 and 4).

*Example No. 2.*

The Pennsylvania Railroad removed 54 plate girders each 50-ft. long and 4′-6″ deep from one bridge and shortened them to 41-ft. long. These girders were re-used at four other sites to construct single line through-type bridges with standard concrete decks. The weight of each girder was approximately 15-tons. No details are provided of erection procedure.




INDIAN GOVERNMENT RAILWAYS

KRISHNA BRIDGE

LONGITUDINAL SECTION

(Showing Method of Erecting New Girders)

CROSS SECTION

(Showing Position of New Girders before Slueing)

FIG. 3.

*Example No. 3.*

The Pennsylvania Railroad shortened 8 wrought iron plate girders 5′-6″ deep from 72′-0″ to 68′-4″ long and used them to construct a new two span single line bridge alongside a similar structure in connection with the doubling of the track. Four girders were placed under the new track with a concrete ballasted deck. The weight of each girder was approximately 10-tons.

Fig. 4. — Krishna Bridge. Indian Government Railways.

Fig. 5. — Erecting girders. Cod-Beck Bridge. British Railways.

*Example No. 4.*

The North Eastern Region of the British Railways used four steel plate girders 85-ft. long and 7′-0″ deep in the course of widening the Cod-Beck bridge from two to four tracks. The existing bridge consisted of two masonry arches and the new lines were placed on either side of this, each track being supported on two plate girders placed under the rails with the sleepers bolted to the top flanges. Only minor alterations were made to the girders which were conveyed to the site on bolster wagons and placed in position on previously prepared abutments with the aid of two 15-ton steam breakdown cranes (see fig. 5).

*Example No. 5.*

Wrought iron plate girders from bridges on abandoned lines were used by the North Eastern Region of the British Railways in constructing a new single line bridge of five spans over the River Ouse. Two girders 7′-6″ deep were shortened in length from 96′-0″ to 75′-6″, four girders 6′-0″ deep were shortened in length from 66′-6″ to 63′-3″ and four trough girders 2′-6″ deep and 43′-0″ long were used with only minor alterations. The girders were placed

Fig. 6. — Erecting girders. River Ouse Bridge. British Railways.

directy under the rails and the sleepers bolted to the top flanges. The new bridge was built parallel to an existing railway bridge and temporary rolled steel joists were placed at right angles to the tracks between the existing and the new piers. The girders were conveyed to the site on bolster wagons and lowered on to these temporary joists from the existing bridge by means of two 15-ton steam breakdown cranes. The two girders of each span were then braced together and slued into position on the new piers (see fig. 6).

*Example No. 6.*

On the South African Railways an 80-ft Pratt truss through-span was recently heavily damaged by a derailment of wagons. The span was removed by side launching and then dismantled into convenient sections and removed to a workshop where it is to be repaired to its original load capacity and stored until required for re-use at some other site. The damaged span was replaced by a completely new structure.

*Example No. 7.*

The recovery of two 155-ft. span bridges is described by Mr. P. S. A. BERRIDGE, M. B. E., M. I. C. E., in the Journal of the Institution of Civil Engineers for November, 1947. The bridges, the Kachh High Bridge and the Louise Margaret Bridge, were situated on the Sind Peshin section of the North Western Railway, India, which was closed in 1942 following extensive damage by a spate. The bridges consisting of Warren girders of the through-type carried a single line railway over deep gorges. The method of recovering the girders was to use similar girders, obtained from other abandoned bridges, as counterweights. The counterweight girders were connected to the girders to be withdrawn and a vertical strut, consisting of two 40-ft. plate girders obtained from bridges on the same line, erected at the junction point. Each girder was connected to the top of this strut by raking ties. The bridge girders, thus converted into cantilevers, were

Fig. 7. — Recovering girders. Louise Margaret Bridge. Indian Government Railways.

then withdrawn on rollers onto the approach spans where they were dismantled (see fig. 7). The trusses recovered were of wrought iron and unsuitable for re-use on railways. They were re-erected as highway bridges. Each girder weighed approximately 156 tons.

*Example No. 8.*

The Southern Region of the British Railways repaired girders from one bridge and re-used them at the same site. The bridge carries four tracks across a clear span of 27′-0″ each rail being supported by a wrought iron trough girder. Two of these were removed from one track by means of a crane and replaced by two new steel plate girders. The girders removed were transported to workshops on bogie wagons and there repaired. These girders, thus strengthened, were then used to replace the girders removed from the next track and so on, the two girders finally removed being scrapped. The repair work consisted mostly of replacing worn and loose rivets and strengthening the stiffeners.

*Example No. 9.*

The Southern Region of the British Railways carried out similar work on Timberley Viaduct which carries two tracks across the River Arun. The viaduct consists of a central bow-string girder span and 12 shore spans each of 30′-0″. These shore spans are of the deck-type with two wrought iron plate girders per track. Many of these had become weak as a result of corrosion and they were removed two at a time with the aid of a crane, replated as necessary in a workshop and re-used in the place of two more weak girders. Two new steel plate girders were used for the first substitution and the existing girders finally removed were scrapped.

*Example No. 10.*

The Indian Railways have carried out the strengthening of several 40′ span girders on a programmed basis by removing the girders to a workshop for repair and re-using them at similar sites. These bridges are on a single line and consist of two plate girders placed under the rails, the sleepers resting on the top flanges. The procedure adopted was as follows :—

The girders were temporarily raised 6″ and supported on a cluster of old rails arranged clear of the existing bedstones which were then removed and replaced by reinforced concrete bedstones cast in-situ. During a block between trains, the old girders were removed by cranes and replaced either by new girders or by strengthened girders from other similar sites resting on the new bedstones. The displaced girders were transported to the workshops for strengthening (if this was found economical) or alternatively scrapped. In one example quoted the strengthening work consisted of the provision of new stiffeners and mild steel bearing plates. The strengthened girders were then used at another site to replace similar girders due to be strengthened.

## 8. Methods of strengthening metal bridges.

In view of the fact that the primary subject of this report, namely the removal, strengthening and re-use of metal bridges, is rarely adopted by the railways replying to the questionnaire, it is thought that a short summary of the methods adopted for strengthening bridges will form a useful addition.

Where it is found necessary to increase the section of individual members, this is done by providing plates, angles or tees which are rivetted or welded according to individual circumstances. When plating over corroded

members it is generally considered advisable to seal the corroded area by the use of light sealing welds in order to prevent further corrosion.

Welding to wrought iron is not normally adopted, although railways in the U. S. A. and the Scottish and Southern Regions of the British Railways have performed this satisfactorily, but it is generally confined to minor connections and small attachment details. These railways have also, on rare occasions,

Some railways have on occasions strengthened bridges by the inclusion of additional members. The London Midland Region of the British Railways has added diagonal members between stiffeners to plate girders with corroded webs, increasing the size of the stiffeners where necessary, thus, in effect, converting the plate girder to an open web girder. The Western Region of the British Railways has added knee-bracing to top chords in order to reduce

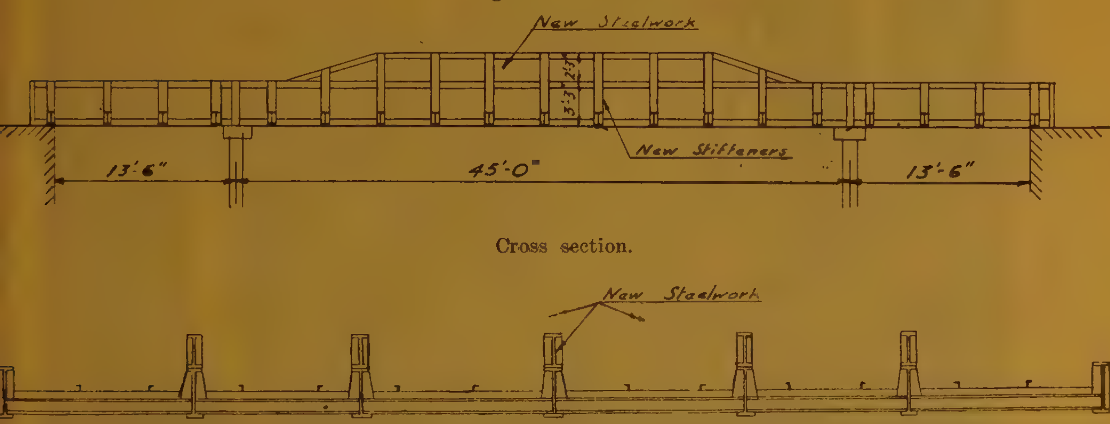



Fig. 8. — Example of bridge girder strengthening. British Railways - Southern Region.

welded gusset plates to rivet heads and built up wasted members and rivet heads by depositing weld metal. The A. R. E. A. reports that a considerable number of bridges strengthened by welding have failed. Although no other country reports such failures, it must be realised that strengthening by welding is adopted in the U. S. A. to a far greater extent than elsewhere. The application of tests to welds is not reported.

No railway reports the use of high tensile steel or non-ferrous metals for strengthening bridges, nor has the use of concrete been adopted for increasing the area of compression members.

the unsupported length of the compression member. The Southern Region of the British Railways has increased the depth of a wrought iron girder from 3′-3″ to 5′-6″. This was achieved by rivetting, under normal traffic, mild steel plates in short sections 2′-0″ long to the top chord of the existing girder, the existing rivets being removed and replaced in the process. The new section in mild steel was then welded to the added plates during a short possession (see fig. 8). Other railways have also adopted similar measures, the renewal of floor systems being a common occurrence, but no details have been provided. Such additions are

generally only adopted when the dead load stresses are small or can be removed by jacking or other means.

A method of strengthening metal bridges recently adopted in the U. S. A. and details of which have been provided by the A. R. E. A. is worthy of special mention. This is the shortening of eyebars by heat treatment. Clamps are placed on the eyebar 2 or 3 feet apart and a 12″ length of the bar in between the clamps heated to 1 600-1 800 degrees Fahrenheit by means of oxy-acetylene torches. A pyrometer is used to measure the temperature. The eyebar is then shortened by drawing the clamps together by means of two bolts. The required amount of shortening, which may vary from $^1/_{32}$″ to 1 ¼″ is measured by trammel points between two punch marks previously made on the eyebar (see fig. 9). In order to determine how much the bar must be shortened, an estimate of the dead load stress may be made by measuring the frequency of vibration of the bar. The whole procedure can be completed in one hour. The A. R. E. A. have carried out tests on wrought iron bars so treated and have reached the conclusion that the fatigue and ultimate strength of the metal are not appreciably affected whereas, when the bar is cut and welded plates and buckles introduced only 35 % of the original fatigue strength is realised and if the bar is cut and spliced with welded and rivetted plates only 50 % of the original fatigue strength is realised.

Fig. 9. — Shortening eyebars by heat treatment. U. S. A.

## 9. Conclusions.

All railways adopt conventional theoretical calculations when assessing the strength of existing bridges. The use of electrical strain gauges for verifying these calculations is increasing rapidly and such use obviously opens up a wide field for research in verifying certain design assumptions and the behaviour of steel structures under heavy moving

loads. The stresses allowed in existing bridges are generally somewhat higher than those specified for new bridges.

Each case of a bridge reaching the theoretical limit of safety is dealt with on its own merits, but the most general method of dealing with such a bridge is to renew it completely. Strengthening in-situ usually compares unfavourably with complete renewal, particularly in the case of short and medium spans, because the higher cost of a new bridge is off-set by increased load capacity, longer life, less maintenance cost and less obstruction to traffic during erection. Worn-out bridges are seldom worth salvaging and consequently the re-use of displaced spans is only possible where lines have been abandoned or re-classified. Where such bridges are to be re-used, the most favoured method of strengthening them is to shorten the spans or to increase the number of girders. The removal of bridges for strengthening and subsequent re-use is only advantageous in the rare cases of several interchangeable short spans and multiple span bridges. Only in these two cases or where lines are re-classified, is any programmed basis attempted for the replacement of weak spans. The re-use of girder spans is best applied in the case of bridges of the plate girder deck-type and such a procedure is confined almost entirely to this type of bridge.

Welding presents a convenient and cheap method of strengthening bridges, but at the present time this cannot be entirely relied upon and is certainly not a favoured means of strengthening existing wrought iron girders.

[ 621 .335 ]

INTERNATIONAL RAILWAY CONGRESS ASSOCIATION

ENLARGED MEETING OF THE PERMANENT COMMISSION
(LISBON, 1949.)

QUESTION II.

# Electric locomotives for fast trains (75 m.p.h. and over). Discussion of adopted and projected types.

1) Arrangement of the axles.
2) Type of axle drive :
   a) motor suspended from the nose;
   b) flexible transmission.
3) Electric motor characteristics.
4) Braking.

## REPORT

*(English speaking countries.)*

by G. A. DALTON, M.I.E.E., M. (S.A.) I.E.E.
Chief Electrical Engineer, South African Railways.

### Introduction.

At the outset I feel it incumbent on me to pay tribute to the Permanent Commission for the honour conferred on the great State organisation which I am privileged to serve, the South African Railways and Harbours, culminating as it has done in my appointment to undertake the responsibilities and duties as Reporter for Subject II. This is the first occasion, so I understand, on which the South African Railways has received from the Association recognition of this nature.

The generous action on the part of the representatives of Great Britain on the Permanent Commission in nominating South Africa as the Reporter country for this subject is fully appreciated, and is accepted as a compliment to South Africa for its prowess as the leading protagonist for electric traction in the membership of the Commonwealth of Nations, although cognisant of the fact that due to terrain and gauge limitations it is unable to contribute anything from practical experience to the study of Subject II.

Finally, I am indebted to Brigadier W. Marshall Clark, the General Manager of the South African Railways and

Harbours, for the confidence displayed in authorising me to undertake the preparation of the report.

In response to the General Secretary's letter No. 8620 dated July 27th, 1948, addressed to all Member Administrations, I am pleased to record that replies were received from the undermentioned :—

Sir Eustace MISSENDEN, Chairman, and Mr. C. M. COCK, of the Railway Executive, British Railways.

Mr. William T. FARICY, President, Association of American Railroads.

Mr. F. I. SNYDER, President, Bessemer and Lake Erie Railroad Company.

The Secretary General, Egyptian State Railways.

The Secretary, Costa Rica Railway Company.

Director General, Ministry of Communications (Railway Division), Government of Pakistan.

Acting General Manager, Nigerian Railway.

General Manager, East African Railways and Harbours.

Mr. F. K. SAH, Director General Railway Department, Ministry of Communications, China.

Acting General Manager, Sudan Railways.

Mr. H. T. COVER, Chief of Motive Power, The Pennsylvania Railroad.

Brigadier W. MARSHALL CLARK, General Manager, South African Railways and Harbours.

The Secretary, Victorian Railways, Australia.

The Acting General Manager, Ceylon Government Railway.

The Chief Controller of Standardisation, Railway Department, Government of India, New Delhi.

The Secretary, London Transport Executive.

The General Manager, New Zealand Government Railways.

The Chief Mechanical Engineer, Burma Railways.

The report has been built up and framed from a condensation and analysis of the replies furnished by Member Administrations to the questionnaire which was circularised. The data has been submitted somewhat succinctly in tabulated form, and from this the main endeavour has been to set out briefly, an indication of the trend of design leading up to the modern conception of the ultra fast locomotive. No information has been tendered regarding projected types of locomotives, although it has been ascertained that there are types in the development stage.

As a result of the late rendition of replies, the lack of explanatory information where this would have been of infinite value in clarifying important design features, together with the time factor in submitting the report, it has not been possible to fulfil the original intention of featuring a fulsome narrative replete with illustrations, etc. However, it is to be sincerely hoped that what has been deduced, together with the schedule attached, in which data have been collated and arranged in chronological order in keeping with the questionnaire, that Members will find adequate material to facilitate and engender discussion.

It will be obvious to all that the report is coloured throughout by the practice evolved and developed by the United States of America. Without going into the economics of their electric traction systems, with special reference to high speed locomotives, there is no doubt about the pre-eminent position held by this country, in this particular field, throughout the English speaking world. Perhaps this is as it should be for did not Thomas A. EDISON build and operate experimental electric railways in Menlo Park during the years 1880 and 1882.

In this connection special mention should be accorded to the Pennsylvania Railroad for the development works which they have consistently undertaken, placing them in the unique, proud and dominating position which they occupy in the sphere of high speed electric traction. It can be conveniently mentioned here that, from those records in my possession, I have gleaned that the Americans are operating close on 300 locomotives designed for a service speed of 70 miles per hour, and a very large number with a mile a minute performance, which, of course, comes within the category of « very high speed » in countries operating narrow gauge lines, but not within the scope of this report. The hope can be cherished that the United States of America will be represented at the Lisbon Convention.

## THE REPORT — QUESTION II.

### TERMS OF REFERENCE.

**Electric locomotives for fast trains (75 miles per hour, and over).**

**Discussion of adopted and projected types :**

(1) **Arrangement of the axles.**

(2) **Type of axle drive.**

(a) *Motor suspended from the nose.*

(b) *Flexible transmission.*

(3) **Electric motor characteristics.**

(4) **Braking.**

### 1. Arrangement of axles.

The subjoined tabulation is indicative of the general progress which has been made by the American authorities in the arrangement of axles applicable to high speed services :—

| | |
|---|---|
| 1910 | 2-B+B-2. |
| 1913 — 1927 | B-B+B-B. |
| 1930 — 1931 | 2-B-2. |
| 1931 — 1935 | 2-C-2. |
| 1935 — to date. | 2-C+C-2. |

Seemingly the last mentioned axle arrangement of 2-C+C-2 is now the adopted standard of the Railroads operating in the United States of America.

In so far as the British and Indian locomotives are concerned, operating respectively on the Southern Section of the British Railways and the Great Indian Peninsula Railways, the wheel arrangement for the former is O-C-C-O whilst for the latter, of which there are three types, two conform to 2-C-2 and one to 1-C-2. The British locomotives were commissioned for service after 1939, and the Indian types during 1928.

It is quite evident from the foregoing that the Railroads in the United States of America, operating high speed services with locomotives, after extensively trying out, first the bogie type and then the rigid frame type, have now, born of their experience, accepted the articulated bogie type with 2 axle guiding bogies as their standard design.

The diameter of the driving wheels at the onset, in the case of the locomotives with Jack Shaft side rod drive, was 72 inches, and 36 inches with respect to those designed with gearless drive, but the modern tendency is to design the 2-C+C-2 type of locomotive, utilising driving wheels of 56 inches, and 57 inches diameter. Guiding bogie wheels have more or less remained at 36 inches in diameter.

It will be noted that the axle loading, of rigid frame locomotives, on the driving wheels is as high as 39 tons (2 000 lbs), presumably to achieve the required adhesion, whereas with the latest type American 2-C+C-2 locomotive the axle loading is 25.25 tons.

The axle loading on the guiding trucks has progressively increased from the region of 14 tons to 21.75 tons on the latest type of American locomotive.

Cross equalisation, with a view to securing improved springing of the locomotives on the driving wheels, has

not been favoured in British practice, and, so far as American practice is concerned, it has, in the past, only been applied to the rigid frame type of locomotive. Equalisation between driving axles has been standard practice for many years.

From the statistics submitted it would appear that the Pennsylvania Railroad have consistently specialised in oil lubricated roller bearings for their locomotive axles, whereas all the remaining Railways covered in this report, have reposed their faith in plain oil lubricated bearings.

In the case of the modern American locomotive viz: the articulated bogie type, the method of supporting the body on the bogies is achieved by providing one centre pivot for each driving bogie, in conjunction with two side steady bearers for each bogie. Two spring loaded bearers are also provided to distribute the load between the driving and guiding bogie trucks. No information has been tendered regarding the type of centre pivot in use, and it will be interesting to ascertain whether the semispherical or flat type has been adopted.

With regard to locomotives of British design the body is supported on two segmental bearings of large diameter located centrally with the middle axle of each bogie and interposed between it and the outer axles. The bearings take both vertical and horizontal forces, and at right angles to these bearings, above the middle, there are two vertical segmental bearings which take horizontal side thrust only.

It is interesting to record that since 1930 the Railroads of the United States of America have resorted exclusively to the use of cast steel bogie and main frames, whilst British practice has not departed from frames constructed of plates rivetted, welded or bolted as the case may be.

During 1910, when locomotives with Jack Shaft drives were constructed in the United States of America, it was customary to dynamically and statically balance the driving wheels, but with the modern type of articulated bogie locomotive it would appear that balancing of the driving wheels is not undertaken, although an increase in maximum speed over the Jack Shaft of 20 miles per hour is reflected. At the higher speeds it can naturally be assumed that any out of balance would be reflected in excessive vibration. Locomotives of British design have not had their driving wheels balanced, but it is known that balancing in the case of British designed diesel-electric locomotives, operating at speeds in excess of 75 miles per hour, is being pursued.

With regard to the application of damping or restraining devices to prevent or minimise nosing or hunting, it is revealed that with regard to those locomotives operating on the Great Indian Peninsula Railways, no restraining devices are provided, but those locomotives in service on the Southern Section of the British Railways are equipped with light control springs which tend to keep the bogie in line with the underframe.

In the case of American designed locomotives such devices are featured on all stock designed and constructed since the year 1930. Generally it is the practice to connect the rear end of the guiding bogie truck to the main driving bogie truck frame by means of a spring restrained rocker device. This device is designed to preclude undue oscillations of the guiding bogie truck around its centre pivot and to add stability at high speeds. In addition, a roller type lateral restraint device, with a relatively high initial displacement force, is attached to one driving bogie frame near the articulating joint, and to the body underframe. This arrangement acts as a stabiliser to prevent the driving bogies oscillating about their centre

pivots at high speeds on tangent tracks, whilst the driving bogies are free to assume a natural inclination for negotiating curves, at the same time a steadying influence is exerted on the body in its relation to the driving bogies.

By reference to the schedule it will be noted that the American type of rigid frame locomotive has a relatively long wheel base in comparison with that of the modern articulated bogie type, but it is apparent that the latest method in the application of restraining devices, not only has the effect of damping oscillating movements, but also has the same effect as an increased wheel base on tangent track.

On the British Railways only casual observations have been carried out, when it was noted that there was no tendency for the bogies to nose. The bogies appeared to ride parallel to the track, and moved laterally with a very low frequency, generally in opposite phase to one another.

In the United States of America extensive and comprehensive track tests have been conducted by the Pennsylvania Railroad, in conjunction with the Westinghouse Electric Company and the General Electric Company of America. These tests were carried out with the prime object of determining the riding qualities of the locomotives, and measuring accurately the lateral forces imposed on the track. For the initial tests four different classes of locomotives were utilised, their wheel arrangements being 2-C-2, 2-B-2, 2-D-2 and 2-C+C-2. On completion of these tests one of each of the 2-D-2 (modified) and the 2-C+C-2 (modified) were subjected to further exhaustive tests, the results of which are reflected on the graph (fig. 1), which is attached to this report.

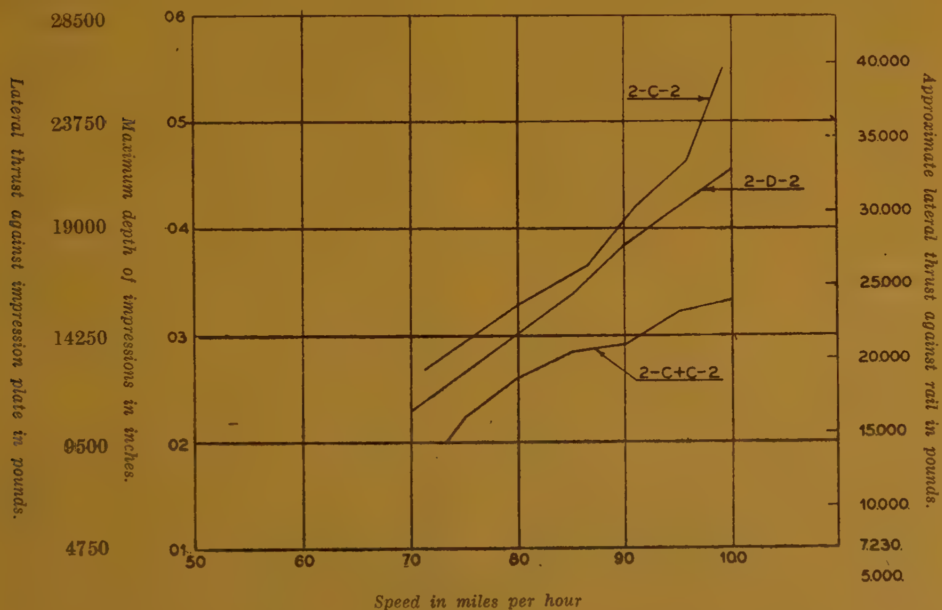



Fig. 1. — Ratio of maximum lateral forces to speed for three electric locomotives.

As a result of all this research work it would appear that the American Railroads have adopted the 2-C+C-2 as the type best suited for high speed operation. The tests indicated lateral forces of much less intensity than any of the other competing types, and these forces increased at a slower rate with an increase of speed. It is interesting to observe that the lateral forces, which were measured, are in the order of the static driving axle load. These axle loads are 75 000 lbs for the 2-C-2, 60 000 lbs for the 2-D-2, and 50 000 lbs for the 2-C+C-2. From information available it would seem that on these locomotives no special means is provided for damping out any high frequency vibrations transmitted to the body as a result of track irregularities, etc.

With regard to the initial side play of the driving and guiding axles, it is noted that with the British designs the total side play is kept to a minimum of $^1/_{16}$ inch, whereas on the American designs the initial clearance is $^1/_8$ inch, and the maximum permissible is almost twice that allowed in the British design. Presumably this latitude is the result of the application of restraining devices, as general experience indicates the deterioration of riding qualities with increased side play.

No special provision appears to have been made on any of the locomotives under review for reducing the effect of weight transference.

## 2. Type of axle drive.

### (a) *Motor suspended from the nose.*

Of all the locomotives analysed for the purposes of this report only one type comes within this category, viz :— The British Railway, Southern Section.

In this case solid gearing is employed, and the nose is suspended on rubber blocks. The suspension bearings are of the split brass type, and the initial side play permissible is stipulated as $^1/_{16}$ inch.

### (b) *Flexible transmission.*

Spring borne motors mounted on the main frame for Jack Shaft drive were constructed for the American Railroads during 1910, but no further locomotives of this type, designed for high speed work, have been considered since then.

Gearless locomotives found some favour in the United States of America up to 1927, but apparently have not been repeated subsequently.

All the remaining locomotives up to the modern standardised version in the United States of America, are equipped with twin armature frame mounted motors, with quill mounted gearing, driving through flexible drives of the Westinghouse type. The gear wheels and pinions are of the solid type.

Of the 26 locomotives in service on the Great Indian Peninsula Railways, 25 are of the quill type, but not in accordance with the Westinghouse design. The odd locomotive conforms to the Brown Boveri link type of drive. Incidentally it will be appreciated that these locomotives are not comparable with the American locomotives in terms of speed in service.

## 3. Electric motor characteristics.

It will be obvious, from the information tendered, that the Jack Shaft and gearless drive types of locomotives have not been favoured by the electric traction authorities in the United States of America for quite a number of years. For this reason it is felt that no constructive purpose will be served by itemising or detailing their motor characteristics.

From about the year 1934 up to the

latest type of locomotive in service on the American Railroads twin armature type frame mounted motors appear to have been adopted as standard practice, and six of these have been installed on each locomotive. All of these locomotives are built to operate on 11 000 volts, 25 cycles single phase contact system. The motor voltages are relatively low being below 900 volts per pair of armatures, and are variable according to the transformer secondary tapping. An analysis of the data submitted reflects that the motors have been designed to operate at their continuous rating at the maximum speed of the locomotive, and forced ventilation is universally employed. From an examination of the technical data furnished, the total weight of the locomotives is 477 000 lbs, the adhesive weight is 303 000 lbs, and the maximum starting tractive effort is of the order of 67 000 lbs, from which an adhesion of 22 % has been deduced. It would appear that these locomotives, whilst providing a performance admirable for their purposes in all respects, have perforce to haul a percentage of idle weight, and it can, therefore, be assumed that over a period of years the assessed value of the consequential additional energy consumption would reach an appreciable amount. It would be interesting to know what the specific energy consumption is for these locomotives. The gear ratios quoted for this type to accomplish 100 miles per hour is 24 to 77, and for those capable of speeds of 90 miles per hour it is 22 to 79.

The locomotives functioning in Great Britain and in India are designed for Direct Current operation, and in each case six motors of the series wound force ventilated type are employed, and the continuous rating of these motors is in all cases below the maximum service speed of the locomotives. The armature voltage is 750 volts and under. Figures for maximum tractive effort have not been forthcoming in all cases, but for one type of locomotive operating on the Great Indian Peninsula Railways, 33 000 lbs. has been quoted. The total weight of this particular unit is approximately 220 000 lbs., and an adhesion at starting of about 26.2 % on the lightest loaded axle has been deduced. It is interesting to note that the additional weight carried on the guiding bogie trucks is 91 600 lbs. The locomotives serving the needs of the Southern Section of the British Railways, weigh in all 234 000 lbs., all the weight being carried on the driving axles. The average adhesion based on the static axle loading is approximately 19.2 %, whilst the maximum tractive effort is given as 45 000 lbs. Due to the fact that the locomotive is of the non-articulated type, the tractive forces being transmitted through the segmental bearings at the top of the bogies, the adhesion on some of the wheels would naturally be materially reduced due to weight transference.

From approximately the year 1934 up to the present time the trend of design has not resulted in any material reduction in the weight of traction motors.

The following schedule reflects, generally, the method of mounting the motors, but presumably the methods pursued in each case are governed by mechanical features or design considerations. In the case of the American designed locomotives, it can, no doubt, be rightfully assumed that the twin armature motor located directly over the axle was adopted as the most satisfactory means of enabling a motor of large output to be accommodated for an individual axle drive.

### 4. Braking.

Air brakes are exclusively used on the American Railroads, whereas compressed air is in use on the locomotive and vacuum brakes on the train in the case of British and Indian Railways. Regenerative or rheostatic braking is

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Subject II : Electric locomotives desi
Schedule accompanying r

| Railroad | N. Y., N. H. & Hartford | Long Island. | Penna. | Penna |
|---|---|---|---|---|
| Date in service | 1932 & 1938. | 1910 | 1910. | 1930. |
| Railroad designation | E.P.3 & E.P.4 very similar | | DD-1. | O-1-A |
| Number in service | 16. | 19. | 14. | 4. |
| 1. A. Axle classification | 2C+C2. | 2B+B2. | 2B+B2. | 2B2. |
| B. Axle load, driving (Tons-2000 lbs) | 22.64. | 24.9. | 24.9. | 39.00 |
| C. Axle load, guiding (Tons-2000 lbs.) | 20 | 14.25. | 14.25. | 19.16 |
| D. 1. Total wheel base (Feet-Inches) | 69'-0" | 55'-11" | 55'-11" | 39'-10 |
| 2. Rigid wheel base (Feet-Inches) | 13'-8" | 7'-2" | 7'-2" | 10' |
| 3. Guiding bogie wheel base (Feet-Inches) | 8'-0" | 6'-7" | 6'-7" | 7' |
| E. Diameter of driving wheels (Inches) | 56 | 72 | 72 | 72 |
| F. Diameter of guiding wheels (Inches) | 36 | 36 | 36 | 36 |
| G. 1. Is cross equalization provided? | No | No | No | Yes |
| 2. Equalization between driving axles? | Yes | Yes | Yes | Yes |
| 3. Equalization between drivers and guiders? | No | No | No | Yes |
| H. 1. Type of axle — box bearings | ◄ Plain | journal | bearing. ► | ◄ |
| I. 1. Type of body support | C.P. & S.B.S. | Rigid | Rigid | Rigid |
| 2. No end and side steady bearers | 2 Pins. | None | None | None |
| 3. Type end and side steady bearers | 4 Spring Pads. | Swing bolster | ◄ | |
| J. 1. Main frame construction | Cast stl. | Forged bar stl. | Forged bar stl. | ◄ |
| 2. Bogie truck construction | Cast stl. | Cast stl. | Built up cast steel and forgings | ◄ |
| K. 1. Are drivers dyn. & stat. balanced? | No | Yes | Yes | No |
| 2. Are guiders dyn. & stat. balanced? | No | No | No | No |

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**eds of 75 miles per hour and over.**
**glish speaking countries.**

| na. | Penna. | Penna. | Penna. | Penna. | Penna. | Penna. | British Railways. | Great Indian Peninsula. |
|---|---|---|---|---|---|---|---|---|
| 31. | 1931. | 1934-5. | 1934. | 1934. | 1935. | 1937-43. | 1930. | 1930. |
| -B. | O-1-C. | P5A- MOD. | GG-1. | R-1. | GG-1. | GG-1. | CC-3. | |
| . | 2. | 28. | 1. | 1. | 57. | 81. | | 22. |
| 2 . | 2B2. | 2C2. | 2C+C2. | 2D2. | 2C+C2. | 2C+C2. | O-C-C-O. | 2-C-1. |
| .6. | 37.5. | 38.15. | 25.25. | 28.75. | 25. | 25.25. | 19.45. | 24.1. |
| .9. | 18.75. | 20.63. | 21.5. | 21.5. | 20. | 21.75. | | 14.67. |
| -10" | 39'-10" | 49'-10" | 69' | 54' | 69' | 69' | 44'-6" | 39'-0" |
| 0' | 10' | 20' | 13'-8" | 23' | 13'-8" | 13'-8" | 16'-0" | 7'-6" |
| 7' | 7' | 7' | 8' | 6'-10" | 8' | 8' | | 8'-0" |
| 72 | 72 | 72 | 57 | 62 | 57 | 57. | 43 | 63. |
| 36 | 36 | 36 | 36 | 36 | 36 | 36. | | 43. |
| es | Yes | Yes | No | Yes | No | No | No | Yes. |
| es | Yes | Yes | Yes | Yes | Yes | Yes | No | No |
| es | Yes | Yes | No | Yes | No | No | No | Yes. |
| | | Roller | Bearings. | | | ▶ | ◀ Plain | bearings. ▶ |
| igid. | Rigid. | Rigid. | C. P. & S.B.S. | Rigid. | Center pivot. | Center pivot. | Segmental bearings. & S.B.S. | C. P. & 2 side bearer plates. |
| one | None | None | 3 Point supp. for each main truck. | None | ◀ 3 Points for | each main ▶ truck. | | |
| wing | bolster. | ▶ | | Swing bolster. | | | | |
| | | Cast | steel. | | | ▶ | Fabricated sections. | Fabricated plates. |
| | | Cast | steel. | | | ▶ | Fabricated plates. | Fabricated plates. |
| No | No | No | No | No | No | No | No | No. |
| No | No | No | No | No | No | No | No | No. |

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**Subject II : Electric locomotives des**
**Schedule accompanying r**

| Railroad | N. Y., N. H. & Hartford | Long Island. | Penna. | Penna |
|---|---|---|---|---|
| L. Anti-hunt & nosing devices for above 75 m. p. h. | Same as Penna G.G.I. | No | No | ◄ |
| M. 1. Nosing tests? | No | No | No | Yes |
| 2. Vibration from track tests? | No | No | No | Yes |
| 3. Body oscillation tests? | No | No | No | Yes |
| 4. Bogie oscillation tests? | No | No | No | Yes |
| 5. Are results available? | No | No | No | ◄ Rail |
| N. 1. Initial clear. Between guides & axle boxes | 1/8" | 1/8" | 1/8" | 1/8" |
| 2. Max. clear. Between guides & axle boxes | Max. 1/4" | Max. 1/4" | Max. 1/4" | Max. 1/ |
| O. 1. Initial side play of drive & bogie axles? | ◄ | | | 1/4" Dr |
| 2. Max. side play of drive & bogie axles | 3/4" Total. | 3/4" Total. | 3/4" Total. | ◄ |
| P. Weight transfer devices | None | None | None | None |
| 2. A. Side rod or individual axle drive | Gear Quill. | Jack shaft side-road. | Jack shaft side-rod. | ◄ |
| B. Type of motor suspension | Spring. | Rigid. | Rigid. | Sprin |
| C. 1. Type of nose suspension | Same as Penna G.G.1. | None | None | ◄ |
| 2. Type of axle suspension bearing | None | None | None | None |
| D. Side play in sleeve type sus. bearing | None | None | None | None |
| E. Type of gearing | Same as Penna G.G.I. | None | None | ◄ |
| F. Type of drive | Flexible Quill. | Jack shaft. | Jack shaft. | ◄ |
| G. 1. Gear ratio | 23 : 78. | | | 36 : 10 |
| 2. Type gear | Solid gear. | | | ◄ |

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**ds of 75 miles per hour and over.**
**lish speaking countries.** *(Continued).*

| a. | Penna. | Penna. | Penna. | Penna. | Penna. | Penna. | British Railways. | Great Indian Peninsula. |
|---|---|---|---|---|---|---|---|---|
| ing | device | and engine | truck spring | restrained | radius bar. | ▶ | Light control springs. | No. |
| s | Yes | Yes | Yes | Yes | Yes | Yes | Observations only. | No. |
| s | Yes | Yes | Yes | Yes | Yes | Yes | | No |
| s | Yes | Yes | Yes | Yes | Yes | Yes | | No |
| s | Yes | Yes | Yes | Yes | Yes | Yes | | No |
| e. | September | 12&19, 1936, | track tests | of electric | locomotives. | ▶ | | No |
| " | 1/8" | 1/8" | 1/8" | 1/8" | 1/8" | 1/8" | .003" New. .020" adjustment. | .015". |
| 1/4" | Max. 1/4" | Max. 1/4" | Max. 1/4" | Max. 1/4" | Max. 1/4" | Max. 1/4" | | .030" |
| 8" | Guides. | | ▶ | Two centre drivers. | ◀ 1/4" drivers | 3/8"Guides. ▶ | 1/16" Initial 9/16" Middle. | .040 |
| 2" | Drivers. | 5/8" Guides. | ▶ | Allowed 1" extra. | ◀ 1/2" Drivers | 5/8"Guides. ▶ | 13/16" | 5/16" |
| ne | None | None | None | None | None | None | No | No |
| | | Gear-quill. | with cup drive | | | ▶ | | |
| ng. | Spring. | Spring. | Spring. | Spring. | Spring. | Spring. | Individual nose suspended. | Individual spring borne frame. |
| | None- | motor | is spring. | supported on | frame. | ▶ | Rubber block. | |
| ne | None | None | None | None | None | None | Sleeve. | |
| ne | None | None | None | None | None | None | 1/16" | |
| | | Involute | spur type. | | | ▶ | Solid | |
| | | Flexible | quill. | | | ▶ | Gear. | Flexible quill. |
| 14. | 31 : 91. | 25 : 97. | 24 : 77. | 27 : 74. | 22 : 79. | 24 : 77. | 65 : 17. | 1 : 3-66. |
| | | Solid | gear. | | | ▶ | | |

**MEETING OF THE INTERNATI**
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**Subject II : Electric locomotives d**
**Schedule accompanying**

| Railroad | N. Y., N. H. & Hartford | Long Island. | Penna. | Penn |
|---|---|---|---|---|
| 3. A. 1. No. of motors . . . . . . . . . . . . . . . . . . . . . | 6 Twin | 2 | 2 | 2 T |
| 2. Type & no. (AC is single phase) . . . . . . . . . . . . | AC-GE 622 | DC-W315 | DC-W315. | AC-GE |
| No. poles . . . . . . . . . . . . . . . . . . . . . . | 12 | 10 | 10 | 18 |
| 3. Type of ventilation . . . . . . . . . . . . . . . . . . | Forced | None | None | Forc |
| 4. Motor volts per armature . . . . . . . . . . . . . . . | 300 | 650 | 650 | 27 |
| 5. Continuous rated H.P. at rail . . . . . . . . . . . . | 600 | 790 | 790 | 125 |
| One hour H.P. at rail . . . . . . . . . . . . . . . | | 1065 | 1065 | |
| 6. Loco. speed (M.P.H.) at motor cont. rate . . . . . . | 56 | 58 | 58 | 63 |
| Loco. cont. T.E. at rail in 1000 lbs. . . . . . . . . . . | 24.1 | 10.2 | 10.2 | 14. |
| 7. Loco speed (M.P.H.) at motor hour rate . . . . . | | 48 | 47.8 | |
| Loco. hour T.E. at rail in 1000 lbs. . . . . . . . . . . | | 16.6 | 16.7 | |
| 8. Maximum T.E. in 1000 lbs. . . . . . . . . . . . . . | 68 | 66 | 66 | 33. |
| 9. Maximum safe speed . . . . . . . . . . . . . . . . | 93 | 80 | 80 | 90 |
| 10. Motor weight — bare lbs. . . . . . . . . . . . . . | 14500 | 44600 | 44600 | 326 |
| B. Motor arrangement in locomotive . . . . . . . . . | Twin over axle. | Jack shaft on main frame. | Jack shaft on main frame. | ◀ |
| 4. A. Mechanical braking systems used : . . . . . . . | ◀ | | | Westing |
| B. Type of electrical braking. . . . . . . . . . . . . | None | None | None | No |
| C. Automatic devices for applying brakes . . . . . . . | ◀ | | Dead | man cc |
| D. Brake lever ratio drivers and guides . . . . . . . . | 1 to 7.16 D.<br>1 to 5.65 G. | 1 to 5.65 D.<br>1 to 9 G | 1 to 5.65 D<br>1 to 9.0 G. | 1 to 7.<br>1 to 8. |
| E. Braking ratio (%) . . . . . . . . . . . . . . . . . | ◀ 75. | ▶ | 100 | 10 |
| F. Are brakes on both drivers & carrying? . . . . . . . | Yes | Yes | Yes | Ye |
| G. Brake blocks per wheel . . . . . . . . . . . . . . | ◀ Single | brake on<br>brake on bogie | driver, clasp ▶ | ◀ |

VAY CONGRESS ASSOCIATION

**eds of 75 miles per hour and over.**
**glish speaking countries.** *(Continued).*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| na. | Penna. | Penna. | Penna. | Penna. | Penna. | Penna. | British Railways. | Great Indian Peninsula. |
| vin. | 2 Twin. | 3 Twin | 6 Twin | 4 Twin | 6 Twin. | 6 Twin. | 6 | 6. |
| LM 1. | AC { W425A GE625A | AC { W425A GE625A | AC-GE 627. | AC-W 428. | AC { W427 GE627 | AC { W 427 CE 627 | D.C. Series wound. | D.C. Series. |
| | 18 | 18 | 12 | 16 | 12 | 12 | 4 | 4 |
| ced | Forced | Forced | Forced | Forced | Forced | Forced | Forced | |
| 5 | 275 | 275 | 340 | 340 | 340 | 340 | 400 | 750 |
| 00 | 1250 | 1250 | 770 | 1250 | 770 | 770 | 180 | |
| | | | | | | | 245 | |
| 6 | 63 | 49 | 100 | 100 | 90 | 100 | 35.5 | 35.7 |
| -8 | 14.9 | 28.7 | 17.3 | 18.75 | 19.14 | 17.3 | 11.13 | 20.2 |
| | | | | | | | 28.5 | 31 |
| | | | | | | | 19.5 | 30.3 |
| .5 | 33.5 | 57.2 | 65.5 | 57.5 | 72.8 | 65.5 | 45 | Not known. |
| 0 | 90 | 90 | 100 | 100 | 90 | 100 | 75 | 85. In service 65. |
| 580 | 32680 | 33150 | 14700 | 16747 | 14700 | 14700 | 5810 | Not known. |
| | Twin | is located | directly over | axle. | | ▶ | One on each axle | 2 Over axle. |
| ir | brake. | | | | | ▶ | Air loco vacuum train. | Air loco vacuum train. |
| one | None | None | None | None | None | None | None | None |
| ented | from | operating by | either hand | or foot. | | ▶ | Deadman's pedal. | None |
| .46 D 8.8 G. | 1 to 7.46D 1 to 8.8 G. | 1 to 8.6 D. 1 to 8.8 G. | 1 to 8.17 D 1 to 9.55 G. | 1 to 7.78 D 1 to 8.8 G | 1 to 9.17 D 1 to 9.55 G | 1 to 9.17 D 1 to 9.55 G | 1 to 5. | 1 to 9. |
| 00 | 100 | 100 | 100 | 100 | 100 | 100 | 82 | 90 |
| es | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Two on | drivers, one | on bogie. | | | ▶ | 2 With own cylinder. | Two on drivers One on bogie. |

not provided on any of the locomotives coming within the confines of this report.

The « Dead Man » method for the automatic application of the brakes is pursued by both the American and British Railways, but this feature is omitted from the locomotives in the service of the Great Indian Peninsula Railways.

In the system of braking commonly in use on the British and Indian Railways, a normal application of the brakes by the driver actuates, not only the vacuum brakes on the train, but by means of a special diaphragm type of valve, the air brakes on the locomotive as well, the release in both cases being proportional. Furthermore, a straight air application valve is provided for an application of the air brakes on the locomotive only, and, conversely it is possible to lock off the locomotive air brakes to secure an independent application of the vacuum brakes on the train.

The brake lever ratio on the American locomotives for the brakes on the driving wheels, varies from 5.65 to 9.17 to one in the case of the latest 2-C+C-2 type locomotive. On the guiding bogie wheels the ratio is of the order of 9.55 to one. The ratio employed on the Indian locomotives is generally 9 to one, and in the case of the British locomotives it is 5 to one.

The brakes are applied to all driving and carrying wheels of locomotives covered by this report, with the sole exception of the Java truck wheels on one type of the Great Indian Peninsula Railway locomotives. It is the general practice to employ two brake blocks on each driving wheel, and one brake block on each guiding bogie wheel. With regard to the British locomotive each brake block is actuated by an independent air cylinder.

On the American locomotives, the total pressure applied to the brake blocks is equal to 100 % of the weight on the driving wheels. In the case of the British locomotive this figure is given as 82 %, whilst for the Great Indian Peninsula Railways it varies from 90 % to 101 %.

**Summary.**

The practice in the Americas, after extensively trying out, first the bogie type, and then the rigid frame type, is to concentrate on the articulated bogie type of locomotive with 2 axle guiding bogies, as the standard design.

A considerable lessening in the diameter of the driving wheels is apparent on locomotives designed with centre pivot and spring body supports, when compared with the rigid frame type.

The axle loading on the driving wheels of the rigid frame type of locomotive, appears to be excessive in comparison with that of the centre pivot spring supported body type of locomotive.

Cross equalisation, with a view to securing improved springing of the locomotives on the driving wheels, has apparently not been favoured by the British designers, but in the United States of America it is applied only to the rigid frame type of locomotive.

The Pennsylvania Railroad, who probably operate one of the most intensive services extant, have consistently specialised in oil lubricated roller bearings for their locomotive axles, whereas all the other Railways repose their faith in plain oil lubricated bearings.

The method most favoured by the American designers for supporting the body on the bogies, is dependent on a centre pivot for each driving bogie in conjunction with two side steady bearers and two spring loaded bearers to distribute the load between the driving and guiding bogie trucks. British practice is based on two large diameter segmental bearings central with the

middle axle of each bogie, and located between it and the outer axles, whilst two vertical segmental bearings are placed at right angles to counter side thrust.

Since 1930 cast steel bogie and main frames have been in use exclusively on the American Railroads, whilst British practice has not departed from plates fabricated either rivetted, welded or bolted.

Balancing of the driving wheels, either dynamically or statically, has not been undertaken on any of the locomotives coming whithin the purview of this report.

Restraining devices to preclude or minimise nosing or hunting at high speeds have been featured on all American designed locomotives since 1930. The locomotives in Britain employ only light control springs, and those in India are not equipped.

Compared with the relatively longer wheel base of the rigid frame locomotive, the application of the restraining devices to the articulated bogie type, not only damps out oscillating movements, but also has the same effect as an increased wheel base on tangent track.

Comprehensive and exhaustive tests to determine the riding qualities of locomotives have apparently only been carried out in the United States of America. These tests appear to have proved conclusively to their satisfaction that the type 2-C+C-2 is best suited for high speed operation.

No special means appear to have been provided for damping out high frequency vibrations transmitted to the body as a result of track irregularities.

With British designs the total side play is kept to a minimum of $^{1}/_{16}$ inch whereas American designs legislate for an initial clearance of $^{1}/_{8}$ inch, with a maximum permissible almost twice that allowed in the British design.

No special provision appears to have been made on any of the locomotives reviewed for reducing the effect of weight transference.

There is a definite preponderance in favour of frame mounted motors, with quill mounted gearing driving through flexible drives.

Twin armature force ventilated frame mounted motors, with relatively low motor voltages, and designed to operate at their continuous rating at the maximum speed of the locomotive, are more extensively used for high speed services.

The latest type of locomotive operating in the United States of America has an outstanding performance, but is, nevertheless, called upon to haul much idle weight which, in terms of additional energy consumption must be appreciable if assessed over a period of time.

The weight of traction motors has not been materially reduced in the last decade.

The method of mounting the motors appears to be governed by mechanical features or design considerations. It will be observed that in the latest American locomotive the motor is located directly over the axle, presumably as the most satisfactory means of accommodating a motor of large output for an individual axle drive.

Air brakes are used exclusively on the American Railroads, whereas on the other Railways dealt with, a combination exists of air on the locomotives and vacuum on the train.

The brake lever ratios employed on the latest type of American locomotives range from 5.65 to 9.17 to one, for brakes on the driving wheels, and 9.55 to one for those on the guiding bogie wheels. British and Indian ratios are reflected as 5 to one, and 9 to one respectively.

It is the general practice to apply brakes to all driving and carrying wheels, two brake blocks being employed

on each driving wheel, and one on each guiding bogie wheel.

On American designed locomotives the pressure applied to the brake blocks is equal to 100 % of the weight on the driving wheels, whilst the figure for the British locomotive is 82 %, and that for the locomotives of the Great Indian Peninsula Railways varies from 90 % to 101 %.

## General.

The report has been compiled strictly in conformity with the Terms of Reference.

All the locomotives in South America, in Canada, and those other English speaking countries whose traction undertakings are electrified, or partially so, operate at speeds less than 75 miles per hour. Such speeds are only common on the Long Island, New York, New Haven and Hartford and the Pennsylvania Railroads, — the British Railways (Southern Section), and the Indian Railways have been brought under review as their locomotives have been designed for higher speeds than 75 miles per hour, but track limitations preclude this and the report has thus benefitted by some slight comparison.

## Acknowledgements.

Whilst paying obeisance to those Member Administrations listed in the « Introduction », I am indebted to Mr. William KNOX, President, and Mr. W. J. CLARDY of the Westinghouse International Electric Company, for their assistance in providing valuable data. I am also appreciative for the information tendered by the General Electric Company of America and the General Manager of the Great Indian Peninsula Railways.

The Paper presented before the Institution of Electrical Engineers, London, by the late Mr. C. E. FAIRBURN, and printed in the November 1938, Journal, together with the copies of the *Railway Age* for September 12th and September 19th, 1936, are commended to Member Administrations for perusal.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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## (JANUARY 1948)

6. 385. (02 ]

## I. — BOOKS.

### In French.

43 621 .31 & 669 .71

**Aluminium dans les réseaux de distribution à enne et basse tension.**

ris, l'Aluminium français, 23bis, rue de Balzac, 1 vol. 5 × 21 cm.) de 138 pages, tables numériques et de breuses illustrations.

---

47 385 (.44)

**Année ferroviaire 1947.**

ris, Plon, éditeur, 1 vol. (14 × 23 cm.) de 224 pa- illustré. (Prix : 225 fr. français.)

---

47 385 (.44)

RJOT (R.).

**es Chemins de fer en France.**

ris (5e), Didier, éditeur, 4 et 6, rue de la Sorbonne. l. relié (15 × 22 cm.) de 64 pages.

---

47 531. (02

VRE (H.).

**ours de mécanique. 1er volume : Statique.**

aris, Dunod et Zurich, Leeman, éditeurs. 1 vol. 5 × 25 cm.) de 384 pages, avec 260 figures. (Prix : fr. français.)

---

47 669 .71

**otions pratiques sur la fonderie de l'aluminium et ses alliages.**

aris, l'Aluminium français, 23bis, rue de Balzac. roch. (10 × 14.5 cm.) de 52 pages, illustrée.

---

945 62. (01 & 669

PROT.

**echerches sur les propriétés mécaniques des métaux.**

aris, édité par Gauthier-Villars. 1 vol. (18 × 26 cm.) 121 pages et 115 figures. (Prix : 100 fr. français.)

### In German.

1947 62. (01

STÄGER (H.).

**Allgemeine Werkstoffkunde.**

Basel, Verlag Birkhäuser. 1 Band in-8, 424 Seiten und 296 Abbildungen. (Preis : broschiert, 42.50 ; gebunden, 46.50 Schweizer Franken.)

### In English.

1947 621 .132 .1 (.42)

**British locomotive types.**

London : The Railway Gazette, 33, Tothill Street Westminster, S. W., 1. One volume (9 1/5 × 6 in), 148 pages, Full cloth. (Price : 8.s6d. pots free.)

---

1947 621 .13 (.09 (.42)

BURTT (F.).

**S. E. & C. R. locomotives : A survey from 1878-1923.**

London : Ian Allan, Ltd, 282, Vauxhall Bridge Road, S. W., 1 (8 1/4 × 5 1/5 in.), 46 pages. Fully illustrated. Paper covers. (Price : 3s.6d.)

---

1947 621 .132 .1 (.42)

**Fowler & Stanier locomotives of the L. M. S.**

London : E. V. Aldrich, 104, Grove Crescent, Kingsbury, N. W., 9 (8 1/2 × 5 1/2 in.), 71 pages. Illustrated. Paper covers. (Price : 6s.6d.) (7/— post free.)

---

1947 621 .333

INGHAM (D. E.).

**Principles of direct current electric traction.**

London : George Newnes, Ltd., Tower House, Southampton Street, Strand, W. C., 2. A volume (8 3/4 × 5 3/4 in.), 248 pages. Illustrated. (Price : 15s/ — net.)

---

1947 656 .1 (.42) & 656 .2 (.42)

KIDNER (R. W.).

**A short history of mechanical traction and travel. Volume I : Road.**

Chislehurst, Kent : The Oakwood Press, 30, White Horse Hill (7 1/2 × 5 in.), 138 pages. Illustrated (Price : 12s.6d.)

---

1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress con-ly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway ice », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

1947 625 .6 (.42)

KIDNER (R. W.).

**The light railways of Britain.**

Chislehurst, Kent: The Oakwood Press, 30, White Horse Hill (7 3/4 × 4 1/2 in.). 40 pages, Illustrated. Paper covers. (Price: 2s.6d.)

---

1947 621 .13 (.42)

**L. M. S. R. locomotive reference book.**

Birmingham, 20: R. P. Sykes, 15, Bragg Road, Birchfields One volume (7 × 5 in.), 97 pages. Paper covers. (Price: 7s.6d.)

---

1947 62. (01

SEELY (F. B.).

**Resistance of materials.**

New York: M. S. John Wiley and Sons Inc. London: Chapman & Hall, Ltd, 3rd Edition, 486 pages, 439 fig., 13 tables. (Price in U. S. A.: $ 4.)

## In Spanish.

1943/1945 385. (05 (.4

IMEDIO DIAZ (A.) & IMEDIO DIAZ (J.).

**Anuario de los Ferrocarriles y de sus Transportes c plementarios, 1943-1945.**

Madrid. Publicaciones del Instituto Politecnico de I rocarriles, Plaza de las Cortes, 3.

## In Dutch.

1947 621 .132 .1 (.4

WALDORP (H.).

**Onze Nederlandsche locomotieven in woord en be** 3de geheel bijgewerkte druk.

Haarlem, De Technische Uitgeverij H. Stam. 1 b (16 × 24 cm.), 183 bladzijden. (Prijs: ing., fl. 5.5

[ 016. 385. (05 ]

# II. — PERIODICALS.

## In French.

### Annales des Travaux publics de Belgique. (Bruxelles.)

1947 62. (01 & 691

Annales des Travaux publics de Belgique, août, p. 409.

CAMPUS (F.). — Essais sur la **résistance des mortiers et bétons à l'eau de mer.** Synthèse des résultats de 1934 à 1945. (15 000 mots, figures et planches.)

---

1947 623 (.493)

Annales des Travaux publics de Belgique, août, p. 479.

PUTMAN (H. J.). — Les **ponts militaires** en Belgique. (3 200 mots, figures et planches.)

---

### Bulletin de documentation technique S.N.C.F. (Paris.)

1947 625 .143 (.73)

Bulletin de documentation technique — S. N. C. F., septembre, p. 251.

L'adoption par l'American Railway Engineering Association de **trois nouveaux types de rails.** (1 800 mots.)

---

### Bulletin de la Société des Ingénieurs civils de France. (Paris.)

1947 625 .243 (.73)

Bulletin de la Société des Ingénieurs civils de France, fasc. nos 16 et 17, p. 189.

MASSERAND. — Le **montage à la chaîne des wagons couverts** au moyen d'éléments préfabriqués aux U. S. A. (1 100 mots.)

### Bulletin de l'Union Internationale des Chemins de fer. (Paris.)

1947 656 (.4 +

Bulletin de l'Union Internationale des Chemins de juillet-août, p. 215.

**Concurrence et coopération entre chemin de fer automobile** en trafic intérieur et en trafic internatio voyageurs et marchandises. — Rapport des Chemins fer fédéraux suisses et des Chemins de fer néerland (avril 1947). (18 000 mots.)

---

### Bulletin des C. F. F. (Berne.)

1947 621 .33 (.49

Bulletin des C. F. F., octobre, p. 150.

**Approvisionnement en énergie électrique** et extensi d'installation. (3 000 mots & fig.)

---

1947 625 .27 (.49

Bulletin des C. F. F., octobre, p. 155.

BÖLSTERLI (J.). — D'une **économie rationnelle matériel dans les ateliers.** (2 000 mots & fig.)

---

### Bulletin des transports internationaux par chemins de fer. (Berne.)

1947 385 .63 & 656 .2

Bulletin des transports internationaux par chemins de f août, p. 303.

DE LA MASSUE (H.). — Le **commissionnaire de tra port devant le droit international.** (6 500 mots.)

**947** **385. (06 .1 (.494)**
etin des transports internationaux par chemins de fer, août, p. 323.
xtrait du **rapport de gestion** pour l'année 1946 de fice central des transports internationaux par chemins fer. (5 000 mots.)

**947** **656 .24 (.44) & 656 .286 (.44)**
etin des transports internationaux par chemins de fer, septembre, p. 345.
URENGE (J.) — **De la force majeure dans les accis de voyageurs** par chemin de fer en droit français. 00 mots.)

**947** **385 .113 (.493)**
letin des transports internationaux par chemins de fer, septembre, p. 366.
a **Société Nationale des Chemins de fer belges** en 1946. 00 mots.)

**947** **385 .113 (.492)**
letin des transports internationaux par chemins de fer, septembre, p. 370.
es **Chemins de fer Néerlandais** en 1946. (1 200 mots.)

## Bulletin Sécheron. (Genève.)

**947** **621 .33 (.494)**
lletin Sécheron, nº 19 F, p. 2.
VERZ (H.). — Tendances actuelles de la technique sse en matière de **traction électrique.** (10 000 mots ig.)

**947** **621 .335 (.494)**
lletin Sécheron, nº 19 F, p. 17.
IEGETSCHWEILER (H.). — Les **automotrices** CFe nos 141-147 des Compagnies Emmental—Berthoud—oune et Vereinigte Huttwil—Bahnen. (1 500 mots fig.)

**1947** **621 .335 (.494)**
lletin Sécheron, nº 19 F, p. 21.
GAIBROIS (P.). — Les **automotrices à courant continu 00/2000 V.** des Chemins de fer Rhétiques. (4 000 mots fig.)

**1947** **621 .331**
lletin Sécheron, nº 19 F, p. 36.
GEREIKE (E.). — **Installations de redresseurs** pour traction électrique. (1 600 mots & fig.)

## L'Ossature métallique. (Bruxelles.)

**1947** **624 .32 (.44)**
Ossature Métallique, octobre, p. 409.
Le **relevage du pont de Pyrimont.** (1 600 mots & fig.)

**1947** **624 .32 (.439)**
Ossature Métallique, octobre, p. 413.
SZÉCHY (Ch.). — **Construction du pont** Arpâd, sur le anube à Budapest. (3 500 mots & fig.)

**1947** **624 .8 (.44)**
L'Ossature Métallique, octobre, p. 427.
Le **reconstruction du viaduc** de Caronte (France). (3 600 mots & fig.)

**1947** **621 .99 & 624 .92**
L'Ossature Métallique, octobre, p. 434.
NICOLAI DE GORHEZ (J.). — Règles pour le **dimensionnement des assemblages et liaisons par rivets et boulons.** (3 000 mots, tableaux & fig.)

## Revue de l'Aluminium (Paris).

**1947** **698**
Revue de l'Aluminium, octobre, p. 309; novembre, p. 325.
MEYNIS DE PAULIN (J. J.). — **La peinture de l'aluminium.** (15 000 mots & fig.)

## Revue générale des chemins de fer. (Paris.)

**1947** **656 .261 (.44)**
Revue générale des chemins de fer, août, p. 253.
GUIBERT. — Quelques **exemples de modernisation des services terminaux** de la S. N. C. F. (5 200 mots & fig.)

**1947** **623 (.44) & 624 .61 (.44)**
Revue générale des chemins de fer, août, p. 261.
**Destructions et reconstructions sur les chemins de fer français** (suite) : RIVET. — Le **viaduc** sur le Rhône à Tarascon. (2 700 mots & fig.)

**1947** **656 .252 (.44)**
Revue générale des chemins de fer, août, p. 268.
VARROY. — Les **lanternes arrière des trains.** (3 800 mots & fig.)

**1947** **625 .174**
Revue générale des chemins de fer, août, p. 273.
PUGET et NEUMANN. — Le **réchauffage des aiguilles en temps de neige.** (4 000 mots & fig.)

**1947** **656 .254 (.944)**
Revue générale des chemins de fer, août, p. 282.
Une **utilisation du Radar sur les Chemins de fer** de la Nouvelle-Galles du Sud. (1 000 mots & fig.)

# In German.

## Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik. (Zürich.)

**1947** **656 (.494)**
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr 3, S. 249.
METZGER (Dr R.). — Die **Gleichbehandlung der Verkehrsmittel durch den Staat.** (15 000 Wörter.)

**1947** **621 .33 (.494)**
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr 3, S. 280.
HÜRLIMANN (H.). — Der **Leichtbetrieb.** (6 000 Wörter & Abb.)

**1947** **656 (.494)**
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr 3, S. 298.
TAPERNOUX (B.). — La **jurisprudence de la Commission fédérale des transports.** (15 000 Wörter.)

## In English.

### The Engineer. (London.)

**1947** **625 .242 (.42) & 625 .26 (.42)**
The Engineer, No. 4785, October 10, p. 339.
**Steel mineral wagon construction** at the L. M. S. works. (1 600 words & fig.)

**1947** **656 .254 (.42)**
The Engineer, No. 4786., October 17, p. 360.
**A. T. C. developments on the G. W. R.** (1 800 words & fig.)

**1947** **669**
The Engineer, No. 4787, October 24, p. 395.
**Cold repair of broken castings.** (1 200 words & fig.).

**1947** **621 .9 (.42)**
The Engineer, No. 4788, October 31, p. 418.
**A universal worm gear testing machine** (900 words & fig.)

### Engineering. (London.)

**1947** **621 .133 .1 (.73) & 621 .437 (.73)**
Engineering, No. 4263, October 10, p. 341.
YELLOTT (J. L.) & KOTTCAMP (C. F.). — United States fuels and the **coal-burning gas-turbine locomotive** *(concluded)*. (3 600 words.)

**1947** **621 .138 .5 (.42) & 621 .431 .72 (.42)**
Engineering, No. 4263, October 10, p. 345.
**Diesel-locomotive shop at Derby L. M. S. R.** (800 words & fig.)

**1947** **625 .242 (.42)**
Engineering, No. 4264, October 17, p. 367.
**16-ton mineral wagons: L. M. S. R.** (1 200 words & fig.)

**1947** **621 .39**
Engineering, No. 4265, October 24, p. 405.
GARRICK (W. D.). — **X-Ray examination of britt welds.** (2 000 words & fig.)

### Journal of the Institute of Transport. (London.)

**1947** **656 (.42)**
The Journal of the Institute of Transport, Aug.-Sept., p. 518.
SEWELL (A. E.). — **Road-rail-water:** price, problems — past, present, presumptive. (2 500 words.)

**1947** **656 .24 (.**
The Journal of the Institute of Transport, Aug.-Se p. 531.
PIKE (J. R.). — The **safe carriage of merchandise rail.** (1 500 words.)

**1947** **385 (06 (.**
The Journal of the Institute of Transport, Oct.-N p. 549.
ROYLE (T. W.). — **A new era of transport.** (2 words.)

**1947** **385 (07 (.**
The Journal of the Institute of Transport, Oct.-N p. 566.
**Education in management for transport.** (2 100 wor

### Journal of the Institution of Civil Engineers. (London.)

**1944.** **656 (.**
Journal of the Institution of Civil Engineers, No. January, p. 129.
RICHARDS (B. D.). — **Post-war transport in Gr Britain.** (67 pages.)

**1944** **691 &**
Journal of the Institution of Civil Engineers, No. February, p. 199.
WHITEHOUSE (H. E.). — **Protective paints steelwork in tropical climates.** (15 pages.)

**1944** **62 (01 & 66**
Journal of the Institution of Civil Engineers, No. February, p. 227.
REYNOLDS (C. E.). — **High-yield-stress steel column and beams reinforcement.** (20 pages, ta & fig.)

**1944** **62 (01 &**
Journal of the Institution of Civil Engineers, No. March, p. 49.
MARSHALL (W. T.). — **Experiments on reinfo concrete column bases.** (4 pages, tables & fig.)

**1944** **625 .4 (.**
Journal of the Institution of Civil Engineers, No. April, p. 71.
ROBERTSON (V. A. M.). — **The engineering ev tion of the London Passenger Transport Board.** (25 ges & tables).

**1944** **624**
Journal of the Institution of Civil Engineers, No. October, p. 243.
CHETTOE (C. S.), DAVEY (N.) & MITCHELL R.). — **The strength of cast-iron girder bridges.** (65 ges, tables & fig.)

**1944**
Journal of the Institution of Civil Engineers, No. November, p. 29.
COLLINS (R. R.). — **The destruction of concrete frost.** (12 pages, tables & fig.)

## The Locomotive. (London.)

**1947** **621 .132 .7 (.42)**
e Locomotive, No. 662, October 15, p. 150.
**Hump shunting locomotives, L. N. E. R.** (900 words fig.)

**1947** **621 .131 .1 (.42)**
e Locomotive, No. 662, October 15, p. 159.
)PIE (R.). — **Locomotive power, performance and ing.** (1 400 words & table.)

**1947** **621 .135 .4 (.42)**
e Locomotive, No. 663, November 15, p. 165.
**Bogies and pony trucks.** (600 words.)

**1947** **621 .132 .1 (.495)**
e Locomotive, No. 663, November 15, p. 166.
**2-10-0 locomotives for Greece.** (300 words & fig.)

## Mechanical Engineering. (New York.)

**1947** **621 .133 .1**
echanical Engineering, October, p. 823.
ROSE (H. J.). — **Trends in solid-fuel research.** (2 400 ords.)

## Modern Transport. (London.)

**1947** **621 .392 (.42) & 625 .143 .3 (.42)**
odern Transport, September 27, p. 15.
**Track welding on L. M. S.** (300 words.)

**1947** **385 (09 (.44) ; 624 .7 (.44) & 625 .28 (.44)**
odern Transport, October 4, p. 3.
**Reconstruction of railways in France.** (2 400 words fig.)

**1947** **624 .7 (.42)**
odern Transport, October 4, p. 5.
**L. M. S. pre-cast, pre-stressed concrete bridges.** (2 000 ords & fig.)

**1947** **621 .131 .2 (.42)**
odern Transport, October 4, p. 10.
TUPLIN (W. A.). — **Dimensional measurements of comotives.** (2 600 words & table.)

**1947** **656 (.494)**
odern Transport, October 4, p. 17.
REMY (X.). — **Road-rail co-ordination in Switzerland** 000 words & fig.)

**1947** **625 .61 (.42)**
odern Transport, October 4, p. 18.
BOURGEOIS (R.). — **The trolleybus in Switzerland.** 400 words & fig.)

## The Oil Engine and Gas Turbine (London.)

**1947** **621 .431 .72 (.73) & 621 .436 (.73)**
il Engine and Gas Turbine, No. 174, October 15, p. 207.
**Railway traction two-stroke power unit.** — The latest pe of General Motors (E. M. D.) 16-cylinder, 1630 h.p., 800 r.p.m. engine fully described. (2 500 words fig.)

**1947** **621 .43 (.42)**
Oil Engine and Gas Turbine, No. 175, November 15, p. 219.
British **Diesel engine catalogue.** (600 words).

**1947** **621 .431 .72 (.42)**
Oil Engine and Gas Turbine, No. 175. November 15, p. 225.
**Turbine locomotives on the G. W. R.** (350 words & fig.)

## Railway Age. (New York.)

**1947** **621 .335 (.73) & 621 .437 (.73)**
Railway Age, September 20, p. 48.
PUTZ (T. J.) & BASTON (C. E.). — **C & O. turbine-electric locomotives.** (1 800 words & fig.)

**1947** **624 .63 (.42)**
Railway Age, September 20, p. 54.
M'ILMOYLE (R. L.). — **Prestressed concrete bridge beams being tested in England.** (2 000 words & fig.)

**1947** **656 .254 (.73)**
Railway Age, September 27, p. 38.
**Train communication on Pennsylvania.** (2 400 words & fig.)

**1947** **624 (.73) & 625 (.73)**
Railway Age, October 4, p. 42.
**Bridge and building** men seek answers to many problems at Chicago. (2 500 words & fig.)

**1947** **625 .142 (.73)**
Railway Age, October 4, p. 55.
Factors in **cost and production of ties.** (1 200 words & fig.)

**1947** **656 .224 (.73)**
Railway Age, October 4, p. 57.
**Musical entertainment on trains.** (1 200 words & fig.)

**1947** **625 .232 (.73)**
Railway Age, October 11, p. 50.
**Dome coaches** for twin « Zephyrs ». (2 400 words & fig.)

**1947** **621 .138 .1 (.73)**
Railway Age, October 11, p. 56.
**Steam locomotive « Service station ».** (2 500 words & fig.)

**1947** **656 .212 .6 (.73)**
Railway Age, October 11, p. 69.
**Diesel-electric locomotive crane.** (250 words & fig.)

**1947** **725 .31 (.73)**
Railway Age, October 18, p. 48.
New Erie **passenger station exhibits modern motif at its best.** (2 100 words & fig.)

**1947** **625 .243 (.73)**
Railway Age, October 18, p. 58.
Pennsylvania devises **special-device merchandise car.** (600 words & fig.)

**1947** **625 .232 (.73)**
Railway Age, October 18, p. 62.
British get **stainless-steel coach.** (800 words & fig.)

**1947** **625 .24 (.73)**
Railway Age, October 18, p. 67.
**Freight car features** urgently needed correction for improved service. (1 400 words.)

## Railway Gazette. (London.)

**1947** **621 .133 .7 (.42)**
Railway Gazette, No. 7, February 14, p. 187.
**Application of base-exchange water softeners to railways.** (1 200 words.)

**1947** **625 .242 (.42)**
Raidway Gazette, No. 14, October 3, p. 375.
**Large-scale manufacture of wagons L. M. S. R.** (1 500 words, tables & fig.)

**1947** **621 .132 .6 (.6)**
Railway Gazette, No. 15, October 10, p. 406.
**Eight-coupled tank engines for West Africa.** (600 words & fig.)

**1947** **621 .32 (.42)**
Railway Gazette, No. 15, October 10, p. 408.
**Air-driven alternator for G. W. R. locomotive lighting.** (600 words & fig.)

**1947** **621 .332 (.45)**
Railway Gazette, No. 15, October 10, p. 412.
PING (A. C.). — **Electrification on the Italian State Railways. — I** *(to be continued).* (1 200 words & fig.)

**1947** **621 .138 .3 (.42)**
Railway Gazette, No. 15, October 10, p. 414.
**Removing dust from rotary machines in electric trains.** (600 words & fig.)

**1947** **656 .254 (.42)**
Railway Gazette, No. 16, October 17, p. 429.
**Wider application of the G. W. R.'s A. T. C, apparatus.** (600 words & diagram.)

**1947** **385 (062 (.73)**
Railway Gazette, No. 16, October 17, p. 435.
**American railway research.** Findings of the Railroad Committee for the study of transportation. (400 words.)

**1947** **721 .5 (.42)**
Railway Gazette, No. 16, October 17, p. 436.
**Snow cornies and the design of railway station roofs.** (500 words & fig.)

**1947** **625 .232 (.73)**
Railway Gazette, No. 16, October 17, p. 437.
**Electronics in the restaurant car.** (1 200 words & fig.)

**1947** **621 .33 (.42)**
Railway Gazette, No. 16, October 17, p. 439.
**Weather forecasting for railways.** (1 300 words & fig.)

**1947** **621 .138 .5 (.43**
Railway Gazette, No. 16, October 17, p. 441.
**Railway workshops in Poland.** (600 words & fig.)

**1947** **656 .283 (.4**
Railway Gazette, No. 16, October 17, p. 446.
**Ministry of Transport Accident Report.** Between Gr rigg and Oxenholme, L. M. S. R., May 18, 19 (600 words.)

## Railway Mechanical Engineer. (New York.)

**1947** **621 .1**
Railway Mechanical Engineer, October, p. 520.
BARRIGER (J. W.). — **Super-power for super-ra roads.** (1 100 words.)

**1947** **621 .134**
Railway Mechanical Engineer, October, p. 529.
FERGUSON (G.). — **The F-2 lubricator for air co pressors.** (800 words.)

**1947** **621 .135**
Railway Mechanical Engineer, October, p. 530.
ELLIS (E.). — **Aftercoolers and automatic drain v ves.** (1 800 words.)

**1947** **625 .2**
Railway Mechanical Engineer, October, p. 533.
WEBB (R. G.). — **Terminal testing of the H. S. brake.** (1 200 words.)

**1947** **625 .2**
Railway Mechanical Engineer, October, p. 557.
**Passenger car painting and its maintenance.** (1 2 words.)

**1947** **621 .13 (06 (.7**
Railway Mechanical Engineer, October, p. 566.
**Locomotive boiler problem.** (3 200 words & fig.)

**1947** **621 .132 .1 (.7**
Railway Mechanical Engineer, October, p. 573.
POND (C. E.). — **Steam locomotives of the Norfo & Western.** (1 200 words & fig.)

## In Danish. (= 439.81.)

## Ingeniøren. (Copenhagen.)

**1947** **656 .211 .7 (.489) = 439 .**
Ingeniøren, No. 22, October, p. M. 37.
« Fyn » the **motor ferry-boat** of the Danish Sta Railways. (1 900 words.)

**1947** **624 .5 (.489) = 439 .**
Ingeniøren No. 23, October, p. B. 77.
GJESSING (S.). — Modern **suspension bridges.** (3 3 words.)

## In Spanish.

### Boletin de la Asociacion International Permanente del Congreso Panamericano de Ferrocarriles. (Buenos Aires.)

**1947** **385 (.82 + .83)**
letin de la Asoc. intern. perm. del Congreso Pan-americ. de Ferrocarriles, mayo-junio, p. 48.
El **tratado chileno-argentino desde el punto de vista roviario.** (6 000 palabras & fig.)

**1947** **656 .28 (.73)**
letin de la Asoc. intern. perm. del Congreso Pan-americ. de Ferrocarriles, mayo-junio, p. 77.
NUNEZ BRIAN (J.). — **Accidentes en los ferrocarri-** de los Estados Unidos de America durante el año endario 1945. (2 000 palabras & cuadros.)

**1947** **385. (09 (.44)**
letin de la Asoc. intern. perm. del Congreso Pan-americ. de Ferrocarriles, mayo-junio, p. 94.
LEZER (L.). — Los **ferrocarriles franceses.** Su orga-ación, situación despues de la guerra y su rol en la onomia nacional. (5 000 palabras.)

### Revista de Obras Públicas. (Madrid.)

**1947** **691**
vista de Obras publicas, agosto, p. 347; septiembre, p. 390.
ECHEVERRIA (F. G.). — **Hormigones permeables:** licaciones. (6 000 palabras, cuadros & fig.)

## In Italian.

### Ingegneria ferroviaria. (Roma.)

**1947** **621 .33 (.45)**
gegneria ferroviaria, luglio-agosto, p. 303.
CORBELLINI (G.). — La scelta del **sistema di tra-ne elettrica** nella ricostruzione delle F. S. (2 000 role.)

**1947** **385. (06 .112**
gegneria ferroviaria, luglio-agosto, p. 305.
La **XIV Sessione dell' Associazione Internazionale del ngresso ferroviario** — Lucerna, 23-28 giugno 1947. 0 000 parole & fig.)

**1947** **624 .2**
gegneria ferroviaria, luglio-agosto, p. 327.
BELLUZZI (O.). — Sul **calcolo delle travi inflesse** in gime plastico. (4 500 parole & fig.)

**1947** **624 (.45) & 721 .9 (.45)**
gegneria ferroviaria, luglio-agosto, p. 347.
La **ricostruzione del viadotto di Desenzano.** (2 000 role & fig.)

**1947** **621 .133 .2**
gegneria ferroviaria, luglio-agosto, p. 359; settembre, p. 405.
CANTUTTI (U.). — **Contributo allo studio dei pro-dimenti atti ad evitare colpi di fuoco in locomotive vapore con forno d'acciaio e combustione a nafta.** 2 000 parole & fig.)

**1947** **656 .222 .4**
Ingegneria ferroviaria, luglio-agosto, p. 365; settembre, p. 423.
GUZZANTI (C.). — Gli impianti per la circolazione dei treni e la **potenzialità delle linee ferroviarie.** (10 000 parole & fig.)

**1947** **621 .335 (.45)**
Ingegneria ferroviaria, settembre, p. 372.
Nuove **locomotive elettriche di manovra con meta-dinamo.** (100 parole & fig.)

## In Dutch.

### Spoor- en Tramwegen. (Utrecht.)

**1947** **625 .62 & 629 .1**
Spoor- en Tramwegen, Nr 9, 24 April, p. 141.
DEN BREEJEN (K. A.). — **Bus of buurtspoorweg?** (2 500 woorden & fig.)

**1947** **656 .224**
Spoor- en Tramwegen, Nr 10, 8 Mei, p. 147.
ERKENS (P. J.). — **Douanebehandeling der reizigers-treinen.** (3 000 woorden & fig.)

**1947** **625 .2 : 625 .62 (.485)**
Spoor- en Tramwegen, Nr 10, 8 Mei, p. 156.
NYMEYER (A. G.). — **Moderne trams** in Stockholm. (1 600 woorden & fig.)

**1947** **621 .133 .1 (.492)**
Spoor- en Tramwegen, Nr 10, 8 Mei, p. 158.
DERENS (L.). — **Poederkool stoken** bij de Nederlandsche Spoorwegen. (3 000 woorden & fig.)

**1947** **385. (09 .3 (.489)**
Spoor- en Tramwegen, Nr 11, 22 Mei, p. 163; Nr 12, 5 Juni, p. 179.
JANSEN (T.). — De **Deense Spoorwegen** 100 jaar. (11 000 woorden en fig.)

**1947** **625 .253 (.492)**
Spoor- en Tramwegen, Nr 11, 22 Mei, p. 168.
BRUIJN (H.). — De **remuitrusting van de Engelsche D. E. rangeerlocomotieven** N. S. serie 500. (1 600 woorden & fig.)

**1947** **621 .33 (.493)**
Spoor- en Tramwegen, Nr 11, 22 Mei, p. 174.
BAEYENS (F.). — De **electrificatie** der lijnen Brussel—Charleroi en Linkebeek—Antwerpen-Noord. (1 000 woorden & fig.)

**1947** **621 .13**
Spoor- en Tramwegen, Nr 12, 5 Juni, p. 186.
**Mogelijkheden voor stoomlocomotieven.** (1 000 woorden & fig.)

**1947** **625 .1 (.493)**
Spoor- en Tramwegen, Nr 12, 5 Juni, p. 188.
BAEYENS (F.). — De **Noord—Zuid-verbinding** te Brussel. (1 000 woorden & fig.)

## In Portuguese.

### Gazeta dos Caminhos de ferro. (Lisboa.)

**1947** **621 .33**
Gazeta dos Caminhos de ferro, 16 de outubro, p. 443.
BRANCO CABRAL (A.). — **Electrificação ferroviária.** (3 000 palavras.)

**1947** **656 (.469)**
Gazeta dos Caminhos de ferro, 16 de outubro, p. 447.
GALLO (J.). — Esperando a **coordenação dos transportes terrestres.** (2 500 palavras.)

**1947** **625**
Gazeta dos Caminhos de ferro, 1 de novembro, p. 4
BIVAR (C.). — **Metropolitanos.** (1 400 palavras.)

## In Swedish. (= 439.71.)

### Nordisk Järnbanetidskrift. (Stockholm.)

**1947** **385. (06 (.48) = 439**
Nordisk Järnbanetidskrift, nº 8, p. 225.
Meeting of the « Nordiska Järnvägsmannasällskape
at Copenhagen, 18-20 August 1947. (10 400 words.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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## I. — BOOKS.

### In French.

**1947** — 62. (03

ODSON (F.).

**Dictionnaire des termes récents, symboles et abré-iations.**

Bruxelles, Société Editec. 1 volume (14×19 cm.) de 0 pages. (Prix en souscription : 250 fr. belges.)

**1947** — 531. (02

HILLON (P.) et TENOT (A.).

**Traité de mécanique générale et appliquée à l'usage des génieurs. Tome II : Statique graphique. Résistance des atériaux. Notions d'élasticité.**

Paris, Dunod, éditeur, 1 volume (18×25 cm.) de 392 ages et 385 figures. (Prix : 790 fr. français.)

**1947** — 62. (02

**Hütte, Manuel de l'Ingénieur.** Tome I (27e édition).

Paris et Liège, Librairie Béranger, éditeur. 1 volume elié (12×19 cm.) de 1544 pages, avec de nombreuses gures. (Prix : 2200 fr. français.)

**1947** — 621 .9

ENOUVEL (L.).

**La tendance actuelle des machines-outils.**

Paris, Dunod, éditeur, 92, rue Bonaparte. 1 volume 13×21 cm.) de 140 pages et 49 figures. (Prix : 360 fr. ançais.)

**1946** — 669 .71

**Notions pratiques sur l'usinage de l'aluminium et de s alliages.**

Paris, l'Aluminium français, 23, rue de Balzac. 1 bro-hure (10×14 1/2 cm.) de 50 pages, illustrée.

### In German.

**1947** — 016 .385

IERR (Dr K.).

**Die Eisenbahn-Literatur des 19. und 20. Jahrhun-erts über Verwaltung, Betrieb, Verkehr. Band I: Früh-eit, 1800—1870.**

München, Selbstverlag des Verfassers, Marsstrasse, 35.

### In English.

**1947** — 669

ALLAN (R. K.).

**Rolling bearings.** (Second edition.)

London: Sir Isaac Pitman and Sons, Ltd., Parker Street, Kingsway, W. C. 2. (Price: 30s. net.)

**1947** — 62 (0.

CLARKE (L.).

**Manual for process engineering calculations.**

New York (U. S. A.): McGraw-Hill Book Company, Inc., 330, West 42nd-street, 18. (Price: 6$.)

London: McGraw-Hill Publishing Company, Ltd., Aldwych House, Aldwych, London, W. C. 2. (Price: 30s.)

**1947** — 621 .433

JUDGE (A. W.).

**Modern gas turbines.**

London: Chapman and Hall, Ltd., 37, Essex Street, Strand W. C. 2. (Price: 28s.)

**1947** — 621 .132 .1 (.42)

NOCK (O. S.).

**British locomotive at work.**

London: Greenlake Publications Limited, 156, Camden High Street, N. W. 1. (Price: 16s/-)

**1947** — 656 .28

**Railway accidents. Legislation and statistics 1825-1924.**

London : The Railway Gazette, 33 Tothill Street, Westminster, S. W. 1, 54 pages foolscap folio in paper cover. (Price: 5s.)

**1947** — 621 .438

SMALL (J.).

**Notes introductory to the theory and design of gas turbines.**

Published by the author at the James Watt Engineering Laboratories, University of Glasgow. (Price: 7s.6d. net.)

**1947** — 669.

SNOEK (J. L.).

**Monographs of the progress of research in Holland:** New developments in ferro-magnetic materials.

Cleaver-Hume Press. Ltd. (Price: 13s.6d.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

[ 016. 385. (05 ]

## II. — PERIODICALS.

### In French.

#### Bulletin de Documentation technique S.N.C.F. (Paris.)

**1947** **656 .212 .6 (.73)**
Bulletin de Documentation technique S.N.C.F., octobre, p. 291.
Un **procédé pratique de manutention et de transport des marchandises**: la « palettisation ». (1 300 mots & fig.)

**1947** **656 .254 (.73)**
Bulletin de Documentation technique S.N.C.F., novembre, p. 328.
**Dispositifs électroniques permettant d'avertir un train de la proximité d'un autre train sur la voie.** (500 mots.)

#### Bulletin des C. F. F. (Berne.)

**1947** **621 .335 (.494)**
Bulletin des C.F.F., n° 11, novembre, p. 171.
**Dispositif de commande des roues de locomotive** au dépôt de Lucerne. (1 200 mots & fig.)

**1947** **656 .257 (.494)**
Bulletin des C.F.F., n° 12, décembre, p. 188.
FELBER (E.). — La nouvelle **station de signaux** du Saint-Gothard. (2 500 mots & fig.)

#### Bulletin de l'Union Internationale des Chemins de fer. (Paris.)

**1947** **656 .234**
Bulletin de l'Union intern. des Chemins de fer, septembre, p. 252.
TACK. — **Le tarif international à coupons pour le transport des voyageurs et des bagages** (T.I.C.). (1 400 mots.)

**1947** **656 .225 (.42) & 656 .261 (.42)**
Bulletin de l'Union intern. des Chemins de fer, septembre, p. 258.
**Containers** pour **transports en vrac.** (1 800 mots.)

**1947** **621 .136 (.42)**
Bulletin de l'Union intern. des Chemins de fer, septembre, p. 260.
TONERI (E. A.). — **Tenders à peser le charbon.** (1 200 mots.)

**1947** **385. (09 (.55)**
Bulletin de l'Union intern. des Chemins de fer, septembre, p. 261.
KEYGHOBADI (P.). — Les **Chemins de fer de l'Iran.** (1 500 mots & carte.)

**1947** **385 (.435 .9**
Bulletin de l'Union intern. des Chemins de fer, septembre, p. 264.
STUMPER. — Le nouveau **régime ferroviaire** du Grand-Duché de Luxembourg. (14 000 mots.)

**1947** **625 .24 (.437**
Bulletin de l'Union intern. des Chemins de fer, septembre, p. 273.
KOLLER (P.). — **Nouveaux wagons** des Chemins de fer de l'Etat tchécoslovaque. (1 500 mots, 1 tableau & fig.)

#### Bulletin des Transports internationaux par chemins de fer. (Berne.)

**1947** **347 .762 (.45**
Bull. des transp. intern. par ch. de fer, octobre, p. 381
CHIMENTI (E.). — Le **contrat de transport** dans le nouveau code civil italien. (9 000 mots.)

**1947** **385 .113 (.494**
Bull. des transp. intern. par ch. de fer, octobre, p. 404
Rapport sur la gestion et les **comptes des Chemins de fer fédéraux** pour 1946. (2 000 mots.)

**1947** **385 .62 & 385 .6**
Bull. des transp. intern. par ch. de fer, novembre, p. 417
**Longueurs kilométriques des lignes auxquelles s'appliquent la C.I.M. et la C.I.V.** (500 mots & tableaux.)

**1947** **656 .225 & 656 .26**
Bull. des transp. intern. par ch. de fer, novembre, p. 420
DURAND (P.). — Les conditions de **transport par containers.** (8 000 mots.)

**1947** **313 : 385 (.493**
Bull. des transp. intern. par ch. de fer, novembre, p. 449
La **Société Nationale des Chemins de fer belges** pendant l'exercice 1945. (Tableau.)

#### Energie. (Bruxelles.)

**1947** **621 .33 (.493**
Energie, juillet-août, p. 156.
LESSINES (A.). — **L'électrification** des chemins de fer belges. (7 000 mots & fig.)

#### Revue générale des chemins de fer. (Paris.)

**1947** **623 (.44), 625 .13 (.44) & 656 .212 (.44)**
Revue générale des Chemins de fer, septembre, p. 289
**Destructions et reconstructions sur les Chemins de fer français** (suite) :
MEUNIER & ADINE. — Les **nouveaux aménagements de la gare de Longueau.** (6 000 mots & fig.)
SIMON. — Le **renforcement des fondations du viaduc** de Lyon-St-Clair. (2 400 mots & fig.)
La **transformation du viaduc** de la Méditerranée. (500 mots & fig.)

947 625 .173 (.44)
ue générale des Chemins de fer, septembre, p. 305.
IROLLE & FASSIAUX. — Chantier de **renouvelle-t de voie** à grand rendement. (1 500 mots & fig.)

947 656 .25 (.44)
ue générale des Chemins de fer, septembre, p. 308.
GRIST. — Le **laboratoire central de signalisation** de . N. C. F. (3 000 mots & fig.)

947 625 .233 (.44)
ue générale des Chemins de fer, septembre, p. 314.
ELAGNEAU & DIDIER. — **L'éclairage des voitures** hemins de fer par lampes fluorescentes. (2 000 mots g.)

947 621 .335 (.44)
ue générale des Chemins de fer, septembre, p. 318.
ise en essai d'un **prototype d'automotrice électrique** S. N. C. F. (400 mots & fig.)

## La Route du Rail. (Paris.)

946 621 .33 (.44)
Route du Rail, mars-avril, p. 1.
e **programme d'électrification** de la S. N. C. F. et la e Paris—Lyon. (1 500 mots & fig.)

946 656 .211 .7 (.42 + .44)
Route du Rail, mars-avril, p. 5.
e **ferry-boat** de Paris à Londres. (1 500 mots & fig.)

946 385. (09 (.61)
Route du Rail, mai, p. 1.
ICOLOFF (B.). — Les **Chemins de fer Tunisiens.** 00 mots & fig.)

946 625 .42 (09 .3 (.44)
Route du Rail, juin, p. 1.
e **Centenaire du Chemin de fer de Paris à Sceaux.** emin de fer métropolitain. (3 500 mots & fig.)

946 385. (09 (.59)
Route du Rail, juin, p. 9.
es **Chemins de fer Indochinois** (1898-1946). (4 000 s & fig.)

946 385. (09 .3 (.44)
Route du Rail, juillet, p. 1.
e **Chemin de fer du Nord a 100 ans** (1846-1946). 00 mots & fig.)

946 385. (09 (.67)
Route du Rail, juillet, p. 7.
es **Chemins de fer de l'île de la Réunion.** (3 000 mots g.)

## La Technique moderne. (Paris.)

947 656 .254 (.73)
Technique moderne, 1er et 15 octobre, p. 342.
aison radiophonique à très haute fréquence sur les ns aux Etats-Unis. (1 500 mots & fig.)

1947 621 .31 (.44) & 656 .213 (.44)
La Technique moderne, 1er et 15 novembre, p. 349.
GAGE (A.). — Rénovation de la centrale de Gennevilliers. La **manutention du charbon.** (5 500 mots & fig.)

# In English.

## The Engineer. (London.)

1947 621 .138 .1 (.42) & 721 .5 (.42)
The Engineer, No. 4789, November 7, p. 435.
**Precast concrete engine shed roofs.** (1 800 words & fig.)

1947 625 .243 (.42)
The Engineer, No. 4789, November 7, p. 436.
**Construction of all-steel wagons on the L. N. E. R.** (1 500 words & fig.)

1947 656 .25 (.42)
The Engineer, No. 4790, November 14, p. 454.
NOCK (O. S.). — **Continuously controlled cab signalling.** (2 800 words & fig.)

1947 625 .1 (.42)
The Engineer, No. 4790, November 14, p. 467.
**The renewal of the track at St-Pancras station.** (1 800 words & fig.)

1947 698 (.42)
The Engineer, No. 4790, November 14, p. 474.
**American anti-corrosive and anti-fouling paints.** (2 900 words & fig.)

1947 625 .17 (.42)
The Engineer, No. 4790, November 14, p. 483.
**Conductor rail de-icing equipment.** (400 words & fig.)

1947 625 .14 (.42)
The Engineer, No. 4792, November 28, p. 505.
**Track reinforcement on the Southern Railway.** (600 words & fig.)

## Engineering (London.)

1947 621 .392 (.42)
Engineering, No. 4267, November 7, p. 453.
**Light-weight arc-welding set.** (400 words & fig.)

1947 621 .132 .1 (.42)
Engineering. No. 4268, Nov. 14, p. 473.
**Railway locomotives.** (1 800 words.)

1947 62 (01 & 624 (0
Engineering, No. 4269, November 21, p. 484 ; No. 4270, November 28, p. 509.
O'DONOVAN (J. J.). — **Moving loads on continuous beams.** (4 800 words & fig.)

1947 62 (01 & 669
Engineering, No. 4269, November 21, p. 489.
REES (W. P.). — **Stress-corrosion cracking of steels.** (1 000 words).

**1947** **625 .252**
Engineering, No. 4269, November 21, p. 493.
**Railway brake shoes.** (2 000 words.)

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**1947** **624 .5 (.73)**
Engineering, No. 4271, December 5, p. 529.
**Railway bridge with 100-ft. aluminium spau.** (2 600 words & fig.)

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**1947** **62 (01 & 669 .1**
Engineering, No. 4271, December 5, p. 532; No. 4272, December 12, p. 556; No. 4273, December 19, p. 581; No. 4274, December 26, p. 605.
**Brittle fracture in mild-steel plates. — I.** (12 000 words.)

---

## Journal of the Institution of Civil Engineers. (London.)

**1947** **62 (01**
Journal, Institution of Civil Engineers, November, p. 19.
INGLIS (C.). — **Analytical determination of shear stresses and torsion stresses in beams and shafts of any given uniform section.** (42 pages & fig.)

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## The Locomotive. (London.)

**1947** **625 .232 (.42)**
The Locomotive, December 15, p. 182.
**A stainless-steel coach.** (600 words & fig.)

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**1947** **621 .132 .8**
The Locomotive, December 15, p. 187.
BULKELEY (C. V. O.). — **The 4-8-0 locomotive on Colonial railways.** (800 words & fig.)

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**1947** **621 .431 .72 (.42)**
The Locomotive, December 15, p. 188.
**Dock shunting by Diesel.** (1 200 words & fig.)

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**1947** **621 .132 .8 (.85)**
The Locomotive, December 15, p. 195.
2-8-0 freight locomotive. Triejillo Railway. Peru. (600 words & fig.)

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## Modern Transport. (London.)

**1947** **656 .2**
Modern Transport, October 11, p. 3.
ROYLE (T. W.) — **Transport methods and organisation.** (Problems of new era.) (1 500 words.)

---

**1947** **621 .335 (.4)**
Modern Transport, October 11, p. 5; October 18, p. 17; October 25, p. 17.
**Manning of electric locomotives.** A survey of European practice. (4 400 words & fig.)

**1947**
Modern Transport, October 11, p. 15.
DOW (G.). — **Public relations on the railways. Fu**tions and organisation. (1 500 words.)

---

**1947** **621 .138 .3 (.42) & 621 .338 (.**
Modern Transport, October 18, p. 16.
**Inspection of rolling stock.** Side pits at London Tra port depots. (600 words & fig.)

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**1947** **656 .254 (.**
Modern Transport. October 18, p. 19.
**Noteworthy G. W. R. signalling advance.** A. T. brought up to date. (1 200 words & fig.)

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## The Permanent Way Institution Journal and Report of Proceedings. (Tonbridge, Kent.)

**1947** **625 .14 (.**
The Permanent Way Institution Journal and Report Proceedings, August, p. 89.
BELSHAM (W.) — **Pre-assembly track relaying. Southern Railway.** (2 500 words).

---

**1947** **625 .15 (.**
The Permanent Way Institution Journal and Report Proceedings, August, p. 94.
MANSBRIDGE (J.). — **Improvements to point crossing layouts.** (2 500 words & fig.)

---

## The Railway Age. (New York.)

**1947** **625 .232 (.**
Railway Age, October 25, p. 39.
STEWART (C. D.). — **Load compensating brake g** in service. (1 200 words & fig.)

---

**1947** **625 .142 (.**
Railway Age, October 25, p. 49.
RISHELL (C. A.). — **Research to improve cross** urged. (1 600 words & fig.)

---

**1947** **656 .1 (.73); 656 .2(.73) & 656 .7(.**
Railway Age, October 25, p. 52.
**P.T.O.S. size up the latest competition.** (1 200 wor

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**1947** **625 .243 (.**
Railway Age, November 1, p. 33.
Pullman-Standard delivers **first boxcars built to P- design.** (1 500 words & fig.)

---

**1947** **693 (.**
Railway Age, November 1, p. 38.
**Prevention and control of fires** subject of two- meeting. (1 200 words.)

---

**1947** **621 .131 .2 (.73) & 621 .133 .1 (.**
Railway Age, November 1, p. 45.
New **Southern Pacific plant for combustion test.** ( words & fig.)

### Railway Gazette. (London.)

**947** **621 .338 (.42)**
way Gazette. No. 16, October 17. p. 447.
ehabilitating London Transport Tube stock after
-air storage. (600 words & fig.)

**947** **656 .226 (.42)**
way Gazette, No. 17, October 24, p. 461; No. 18, October 31, p. 489.
. W. R. zonal goods organisation — 1 & 2. (1 800
ds, fig. & maps.)

**947** **625 .4 (.485)**
way Gazette, No. 17, October 24, p. 464.
nderground railway plans for Stockholm. (500 words.)

**947** **624 .3 (.43)**
way Gazette, No. 17, October 24, p. 468.
ne Roer railway bridge at Düren, Germany. (400
ds & fig.)

**947** **621 .335 (.492)**
way Gazette, No. 17, October 24, p. 469.
ectric traction equipment for Holland. (300 words
g.)

**947** **624 .7 (.460)**
way Gazette, No. 18, October 31, p. 491.
eel and concrete truss road bridge in Spain. (500
ds & fig.)

**947** **625 .144 .4 (.42)**
way Gazette. No. 18, October 31, p. 492.
Pancras relaying. Completion of important nine-
e track renewals involving 40 sets of points and
rossings. (1 200 words & fig.)

### University of Illinois Bulletin. (Urbana.)

**946** **625 .143 .2 (.73)**
versity of Illinois Bulletin. July 11, p. 35.
ENSEN (R. S.). — Fatigue tests of rail webs. (500
ds & fig.)

**946** **625 .143 .3 (.73)**
versity of Illinois Bulletin, July 11, p. 38.
RAMER (R. E.). — A preliminary investigation of
ugated rails. (800 words & fig.)

## In Danish. (= 439.81.)

### Sikringsteknikeren. (Copenhagen.)

**947** **656 .25 (.42 + .44) = 439 .81**
ingsteknikeren. No. 2. November, p. 295.
OBERG (I.). — Report on a visit to London and
relating to the construction of signalling and safety
llations. (continued). (2 800 words & fig.)

**1947** **656 .25 (.489) = 439 .81**
Sikringsteknikeren, No. 2, November, p. 245 and p. 287.
GØTZSCHE (O.). — Safety installation at Saxkobing station. (2 300 words & fig.). — Electric interlocking. (2 700 words & fig.)

## In Spanish.

### Revista del Colegio de Ingenieros de Venezuela. (Caracas.)

**1946** **385 (.87)**
Revista del Colegio de Ingenieros de Venezuela, nº 162, noviembre-diciembre, p. 223.
Recientes disposiciones legales dictadas en Venezuela para la **explotación de los Ferrocarriles Nacionales.** (2 500 palabras.)

**1946** **624**
Revista del Colegio de Ingenieros de Venezuela, nº 162, noviembre-diciembre, p. 226.
SANABRIA (J.). — Apuntaciones acerca de la « **Reglementación Internacional para el cálculo de puentes ferroviarios** ». (2 500 palabras.)

### Revista de Obras Públicas. (Madrid.)

**1947** **691**
Revista de Obras publicas, noviembre, p. 486; diciembre, p. 536.
DE BLAS GOMEZ (I.). — El **hormigon « aireado »** como nuevo material de construcción. (8 000 palabras, cuadros & fig.)

## In Italian.

### Giornale del Genio Civile (Roma).

**1947** **721 .4**
Giornale del Genio Civile, luglio-agosto, p. 325.
MIOZZI (E.). — Un nuovo metodo per il **calcolo delle vôlte.** (8 000 parole, tavole & fig.)

**1947** **624 .2**
Giornale del Genio Civile, luglio-agosto, p. 344.
POZZATI (P.). — Sulle linee d'influenza dei momenti sugli appoggi nelle **travi continue.** (2 000 parole, tavole & fig.)

### Ingegneria ferroviaria. (Roma.)

**1947** **625 .13**
Ingegneria ferroviaria, settembre, p. 401.
LAMAGNA (L.). — **Sollecitazioni esterne sui rivestimenti delle gallerie** profonde in terreni incoerenti. (2 000 parole & fig.)

**1947** **621 .431 .72**
Ingegneria ferroviaria, settembre, p. 413.
FRANCO DI MAJO. — **Trasmissioni elettriche** per automotrici e per locomotive Diesel. (5 000 parole & fig.)

**1947** **625 .234 (.45)**
Ingegneria ferroviaria, settembre, p. 421.
FASOLI (M.). — Il nuovo **aspiratore per i compartimenti** delle carrozze F. S. (1 000 parole & fig.)

## In Dutch.

### Spoor- en Tramwegen. (Utrecht.)

**1947** **656 .223 .2**
Spoor- en Tramwegen, Nr 13, 19 Juni, p. 195; Nr 15, 17 Juli, p. 229.
BURGERS (W. C. L.) & STARING (M.). — Algemeene principes voor de **berekening van de omlooptijd.** (4 400 woorden & fig.)

**1947** **621 .132 .3 (.42 + .73) & 621 .132 .5 (.42 + .73)**
Spoor- en Tramwegen, Nr 13, 19 Juni, p. 197.
DE PATER (A. D.). — Eenige nadere gegevens over de Engelsche en Amerikaansche **oorlogslokomotieven.** (5 000 woorden, tabellen & fig.)

**1947** **385. (09 .3 (.494)**
Spoor- en Tramwegen, Nr 13, 19 Juni, p. 202.
GASSMANN (W.). — Honderd jaar geleden de **eerste spoortrein** in Zwitserland. (1 000 woorden & fig.)

**1947** **621 .133 .3**
Spoor- en Tramwegen, Nr 13, 19 Juni, p. 206.
DERENS (L.). — Veertig jaar **oververhitte stoom.** (2 000 woorden & fig.)

**1947** **623 (.492)**
Spoor- en Tramwegen, Nr 14, 3 Juli, p. 211.
LUCARDIE (J. P. S.). — De **Nederlandsche Spoorwegen tijdens de bevrijding** en hun waarde voor de geallieerde oorlogvoering. (5 000 woorden & fig.)

**1947** **656 .225 (.73)**
Spoor- en Tramwegen, Nr. 14, 3 Juli, p. 222.
NYMEYER (A. G.). — **Pullmantreinen voor stukgoederen:** de « Pacemaker »-treinen van de New York Central. (1 000 woorden & fig.)

**1947** **625 .2 : 625 .62 (.494)**
Spoor- en Tramwegen, Nr 15, 17 Juli, p. 232.
NYMEYER (A. G.). — **Moderne motorwagens** van de stadstram te Bern. (1 800 woorden & fig.)

**1947** **625 .1 (.492) & 623 (.4**
Spoor- en Tramwegen, Nr 16, 31 Juli, p. 243.
KIVERON (J.). — **Herstel van het spoorwegverl** in Limburg ten Zuiden van Venlo en ten Oosten de Maas. (1 700 woorden & fig.)

**1947** **385 .113 (.4**
Spoor- en Tramwegen, Nr 16, 31 Juli, p. 248.
Uit het **jaarverslag** der N. V. Nederlandsche Sp wegen over 1946. (1 200 woorden.)

**1947** **385. (09 .3 (.4**
Spoor- en Tramwegen, Nr 16, 31 Juli, p. 249.
GASSMANN (W.). — De **Zwitserse spoorwegen staan 100 jaar.** (4 000 woorden & fig.)

## In Swedish. (= 439.71.)

### Nordisk Järnbanetidskrift. (Stockholm.)

**1947** **656 (.485) = 439**
Nordisk Järnbanetidskrift, No. 9, p. 255.
**Effect of the airline traffic on the railway traffic.** Lecture given by M. K. DAHLUM at the Nordi Järnvagsmannasällskapet s' meeting at Copenhagen. the 19th August 1947. (4 600 words.)

**1947** **656 .25 (.485) = 439**
Nordisk Järnbanetidskrift, No. 9, p. 267.
SMEDBERG (T.). — **New safety measures on Swedish State Railways.** (1 800 words.)

**1947** **625 .111 (.485) = 439**
Nordisk Järnbanetidskrift, No. 9, p. 271.
ÖSTER (M.). — **Extension of the « East Coast » R way.** (3 600 words.)

### Svenska Lokaltrafik Föreningen. (Stockholm

**1947** **656 .25 (.73) = 439**
Svenska Lokaltrafic Föreningen, No. 4, October, p. 1
BOBERG (I.). — **Signalling system** of the subur railways in the U. S. A. (3 300 words & fig.)

**1947** **625 .14 : 625 .42 = 439**
Svenska Lokaltrafik Föreningen, No. 4, October, p. 1
DAHLBECK (E.). — The **permanent way** of underground railways. (6 600 words & fig.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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## I. — BOOKS.

### In French.

**1947** **531. (02**

AVRE (H.).

**Cours de mécanique.** Tome I : **Statique.**

Paris, Dunod, éditeur, 1 volume (16.5 × 25 cm.) de 4 pages, avec 260 figures. (Prix : 820 fr. français.)

**1947** **55**

AISIN (F. junior).

**Géologie du génie civil.**

Louvain, Dewallens, éditeur, 55, avenue des Alliés. fascicules (21 × 27 cm.) de 143, 140 et 193 feuillets.

**1947** **698**

IENTZ (L.).

**Notions fondamentales sur les vernis et peintures.**

Paris, Gauthier-Villars, éditeur, 1 volume (16×25 cm.) 256 pages, avec 30 figures. (Prix : 475 fr. français.)

**1947** **691 & 698**

EISSI (P.).

**Contribution à l'étude de la protection de l'acier par s peintures au brai-aluminium.** Expérience d'une durée dix ans sur une arche en acier de 75 m. de portée.

Paris, Office Technique pour l'Utilisation de l'Acier ). T. U. A.), 25, rue du Général Foy. 1 brochure 1×26.5 cm.) de 32 pages, illustrée.

**1946** **536**

OY (M.).

**Thermodynamique des systèmes propulsifs à réaction et la turbine à gaz.**

Paris, Dunod, éditeur, 1 volume (16×25 cm.) de 0 pages, avec 55 figures. (Prix : 540 fr. français.)

**1947** **313 : 385 (.494)**

**Statistique des Chemins de fer suisses, 1946.**

Berne, Office Fédéral des Transports. 1 volume 1×30 cm.) de 208 pages, avec de très nombreux bleaux. (Prix : 5 fr. suisses.)

### In German.

**1947** **625 .113 & 625 .144 .3**

GYSIN (J.) und MOLL (E.).

**Tafeln zum Abstecken von Kreiskurven und Übergangsbogen, in neuer Teilung (400°).**

Liestal (Schweiz), Druck und Verlag von Lüdin & C°, A. G. 1 Band (11×18), XXII + 174 Seiten, 7 Abbildungen. Verkauf bei Editions Belges « Novitas », 41-43, rue Van Meyel, Brüssel. (Preis : 120 Belg. Frank.)

**1947** **656 .211 (.494)**

MEYER (A.).

**Das Zürcher Bahnhofproblem.**

Zürich, Verlag der Zürcher Handelskammer, Wirtschaftliche Publikationen der Zürcher Handelskammer, Heft 21.

**1947** **656 (.494)**

RYMANN (Dr. H.).

**Die rechtliche Ordnung der Zusammenarbeit und des Wettbewerbes der Verkehrsmittel in der Schweiz.**

Lachen o. J., Buchdruckerei A. Kessler.

### In English.

**1944** **656 .25 (73)**

**Association of American Railroads (A. A. R.). Signal Section.** Reports to be presented at the Annual Meeting. Chicago Ill. October 4 and 5, 1944. **Committee I.** — Economics of railway signaling; **Committee II.** — Interlocking; **Committee III.** — Automatic train control and signals; **Committee IV.** — Automatic block signaling; **Committee V.** — Contracts and instructions. **Committee VI.** — Designs; **Committee VII.** — Materials research; **Committee VIII.** — Highway grade crossing protection; **Committee IX.** — Overhead and underground lines; **Committee X.** — Signaling practice; **Committee XI.** — Electronics.

A volume of 275 pages. Illustrated.

Action by the Committee of Direction, october 4, 1944, on reports printed in the 1944 Annual Meeting advance notice.

A volume of 45 pages. Illustrated.

New York, N. Y., published by the Signal Section, A. A. R., 30, Vesey Street.

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress con- ntly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway ence », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

1947 51
AUSTEN STIGANT (S.).
**Modern electrical engineering mathematics.**
London, Hutchinson's Scientific and Technical Publications, 47, Princes-gate, S. W. 1. (Price: 31s.6d. net.)

1948 621 .132 .1 (42)
GREY (R. L.).
**Great loco story.**
Huddersfield, Quadrant Publications, 390, Wakefield Road (7 1/4×4 3/4 in.), 57 pages. Illustrated. Paper covers. (Price: 2 s. 7 d.)

1947 385 (09 (.54)
PANIKAR (I. A.).
**Indian Railways. A cameo-study.**
Bombay, The Times of India Press. (9 in.×5 1/2 in.), 46 pages. (Price : Rs. 1/8 [about 2 s. 3 d.])

1947 656 .28 (.42)
**Railway accidents. Legislation and Statistics 1825-1924.**
London, The Railway Gazette, 33, Tothill Street, Westminster, S.W.1, 54 pages in Foolscap folio in paper cover. (Price : 5 s.)

## In Spanish.

1947 69
BARCELÓ (G.).
**Hormigon vibrado. Su técnica, su ejecución, dosific ciónes.**
Madrid, Editorial Dossat, S.A., Plaza de Santa Ana, 1 tomo, 247 paginas, con 92 ilustraciones. (Preci 70 pesetas.)

## In Italian.

1946 62
STABILINI (L.).
**Ponti.**
Milano, Libreria Editrice Politecnica. 1 vol., 654 p gine. (Prezzo: L. 900.)

[ 016. 385. (05 ]

# II. — PERIODICALS.

## In French.

### Annales des Mines. (Paris.)

1947 621 .31
Annales des Mines, n° 8, 15 juin, p. 29.
CHAMBERT (B.). — Les conditions requises pour l'agrément des **câbles électriques résistant au feu.** (Traduit de J. C. METCALFE et D. C. JONES. Mechanization, juin 1946). (5 000 mots et tableau.)

### Annales des Ponts et Chaussées. (Paris.)

1947 656 (.64)
Annales des ponts et chaussées, mars-avril, p. 221; mai-juin, p. 367.
LE VERT (P.). — La **coordination des transports** au Maroc. (30 000 mots, tableaux & fig.)

1947 624 .51
Annales des ponts et chaussées, mars-avril, p. 253.
AVENAS (P.). — **Ponts suspendus** à travées multiples et à câbles de tête. (1 700 mots & fig.)

1947 624 .2
Annales des ponts et chaussées, mai-juin, p. 311.
GRIVEAUD (J.). — Etudes et propositions relatives aux **poutres échelles.** (10 000 mots, tableaux & fig.)

1947 624 .2 & 721 .4
Annales des ponts et chaussées, mai-juin, p. 345.
LEVI (R.). — Note sur le **flambement** et en particulier celui des arcs. (7 000 mots & fig.)

### Bulletin de l'Association des Ingénieurs électriciens sortis de l'Institut électrotechnique Montefiore (A.I.M.). (Liége.)

1947 621 .31 (.49
Assoc. des Ing. électriciens, Institut Montefiore, aoû p. 229; septembre, p. 257.
de LEENER (M.). — **L'influence du coût de l'énerg électrique sur le bilan économique** de la Nation. (20 0 mots & tableaux.)

### Bulletin de la Société des Ingénieurs civils de France, (Paris.)

1947 621 .133 .1 (.4
Bulletin de la Société des Ingénieurs civils de Fran (mémoires), janvier-février, p. 27.
POIREE. — **Economies de combustible dans les ch mins de fer.** (8 000 mots, tableaux & fig.)

1947 621 .133 .1 & 621 .
Bulletin de la Société des Ingénieurs civils de Fran (mémoires), janvier-février, p. 44.
PARODI. — **Economies de combustible par l'élect fication des chemins de fer.** (2 000 mots & tableaux.)

## Bulletin des Transports internationaux par chemins de fer. (Berne.)

**1947** **656 (.4)**
ulletin des transports internationaux par chemins de fer, décembre, p. 453.
NOE (G.). — Le développement, depuis la cessation s hostilités, des **organisations des transports intérieurs** Europe. (9 000 mots.)

---

**1947** **313 : 385 (.494)**
ulletin des transports internationaux par chemins de fer, décembre, p. 488.
Les **Chemins de fer fédéraux suisses** en 1946. (Tableau.)

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## Génie Civil. (Paris.)

**1947** **691**
énie Civil, n° 3216, 1er novembre, p. 417.
Le **béton aéré**. (700 mots.)

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**1947** **531 .61**
énie Civil, n° 3218, 1er décembre, p. 452.
Le **Congrès de la Conférence Mondiale de l'Energie** La Haye, 2-9 septembre 1947). (4 500 mots.)

---

**1947** **53**
énie Civil, n° 3218, 1er décembre, p. 459.
**Nouveau densimètre pour la mesure rapide de la den-ité des corps solides.** (300 mots & fig.)

---

**1948** **621 .335 (.44)**
énie Civil, n° 3220, 1er janvier, p. 1.
MACHEFERT-TASSIN (Y.). — Les **nouvelles loco-otives électriques françaises BB 0401.** (5 000 mots, ta-leau & fig.)

---

**1948** **624 .51 (.73)**
énie Civil, n° 3220, 1er janvier, p. 13.
Le renforcement de la rigidité du **pont suspendu** de Bronx-Whitestone, à New-York. (600 mots & fig.)

---

## Revue générale des chemins de fer. (Paris.)

**1947** **385. (06 .112**
Revue générale des chemins de fer, octobre, p. 325.
La **XIVe Session de l'Association Internationale du Congrès des Chemins de fer** (Lucerne, juin 1947). (7 000 mots & fig.)

---

**1947** **625 .215 (.494)**
Revue générale des chemins de fer, octobre, p. 335.
**Bogies à barres de torsion.** (700 mots & fig.)

---

**1947** **625 .14 (01 & 625 .2 (01**
Revue générale des chemins de fer, octobre, p. 340.
BOUTELOUP. — Le **contact rail-roue.** Etude géomé-rique. Méthode des enveloppes. (12 000 mots, tableaux & fig.)

---

**1947** **385 .582 (.44)**
Revue générale des chemins de fer, octobre, p. 354.
Dr. GODLEWSKI (H.). — Dispositions sanitaires nouvelles prises sur la S.N.C.F. pour la **préservation** d'**agents contre la contagion publique.** (2 000 mots, tabl. & fig.)

## La Route du Rail. (Paris.)

**1946** **385. (09 (.61 + .66)**
La Route du Rail, août-septembre, p. 8.
CLAUDON (R.). — Le **Chemin de fer Méditerranée-Niger.** (2 700 mots & fig.)

---

**1946** **625 .28**
La Route du Rail, août-septembre, p. 7; octobre, p. 4.
NEYRET (P.). — Le **problème de la traction.** (2 000 mots.)

---

**1946** **385. (09 (.44)**
La Route du Rail, octobre, p. 18.
**Programme de reconstruction de la S.N.C.F.** Equipement électrique. Matériel moteur. Installations fixes. (2 000 mots & cartes.)

---

**1946** **621 .431 .72 (.44)**
La Route du Rail, novembre, p. 1.
Le **service des autorails** de la S.N.C.F. (1 500 mots & fig.)

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**1946** **385. (07 .13 (.44)**
La Route du Rail, novembre, p. 12.
L'**apprentissage** dans les chemins de fer français. (3 000 mots & fig.)

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**1946** **621 .132 .8 (.494) & 621 .438 (.494)**
La Route du Rail, novembre, p. 18.
La **locomotive à turbine à gaz** et à transmission électrique (Brown-Boveri). (1 200 mots & fig.)

---

**1946/47** **625 .13 (.44 + .45)**
La Route du Rail, décembre, p. 1; janvier, p. 1.
LARTILLEUX (H.). — Le **Mont Cenis.** — La ligne de Culoz à Modane et Turin. (7 000 mots & fig.)

---

**1946** **621 .33 (.44)**
La Route du Rail, décembre, p. 9.
Premiers travaux d'**électrification** Paris-Lyon. S.N.C.F. (Sud-Est). (1 000 mots & fig.)

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# In German.

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## Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik. (Zürich.)

**1947** **656 .23 : 625 .6 (.494)**
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr. 4, S. 353.
FISCHER (W.). — **Tarifarische Verschmelzung** des Verkehrsnetzes der Stadt Bern. (7 000 Wörter.)

---

**1947** **385 .1 (.494)**
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr. 4, S. 372.
THOMANN (F.). — Die Auswirkungen der Sanierung auf den **Finanzhaushalt** der Schweizerischen Bundesbahnen. (12 000 Wörter & Tabellen.)

## In English.

### Bulletin, American Railway Engineering Association. (Chicago.)

**1947** **62 (01 (73) & 624. (0 (73)**
Bulletin, American Railway Engineering Association, No. 468, September-October 1947.
**Impact test on two truss spans Toledo Terminal Railroad.** (58 pages & fig.)

**1947** **625 .28 (73)**
Bulletin, American Railway Engineering Association, December, p. 22.
**Electrification and the development of modern power units**; their influence on railway economics. (1 200 words & tables.)

**1947** **656 (73)**
Bulletin, American Railway Engineering Association, December, p. 28.
**General course of the cost of railway transportation and operation over the past 100 years**; principal determining elements and economic significance. (16 pages and tables.)

**1947** **621 .138 .3 (.73)**
Bulletin, American Railway Engineering Association, December, p. 110.
**Locomotive terminal facilities.** (2 400 words.)

**1947** **656 .225**
Bulletin, American Railway Engineering Association, December, p. 113.
**Facilities for mechanical handling of L. C. L. Freight at freight houses.** (2 000 words.)

### The Engineer. (London.)

**1947** **625 .232 (.42)**
The Engineer, No. 4792, Nov. 28, p. 512.
**A prototype stainless steel coach.** (1 200 words & fig.)

**1947** **621 .132 .8 (.8)**
The Engineer, No. 4792, Nov. 28, p. 513.
**A large narrow gauge locomotive.** (400 words & fig.)

**1947** **385 (09 (.42)**
The Engineer, No. 4793, Dec. 5, p. 523.
The **British Transport Commission.** (1 800 words.)

**1947** **62 (07 (.494)**
The Engineer, No. 4794, Dec. 12, p. 547.
CHAMPION (C. L.). — The **training and work of the Swiss engineer.** (1 200 words.)

**1947** **669**
The Engineer, No. 4794, Dec. 12, p. 551.
Acceptance standards in **radiographic examination of castings and welds.** (1 300 words.)

**1947** **621 .333**
The Engineer, No. 4794, Dec. 12, p. 558.
**Improved electric traction equipment.** (1 600 words & fig.)

### Engineering. (London.)

**1947** **625 .17 (.42) & 656 .215 (.42**
Engineering, No. 4271, Dec. 5, p. 546.
**Track reconditioning and lighting on the Southe[rn] Railway.** (600 words.)

**1947** **669**
Engineering, No. 4271, Dec. 5, p. 548.
BAKER (J. F.). — **Causes of low ductility in mi[ld] steel.** (3 000 words & fig.)

**1947** **621 .431 .72 (.49**
Engineering, No. 4272, Dec. 12, p. 568.
**Fifty years development of the Sulzer Diesel engin[e]** (3 200 words.)

**1947** **621 .132 .3 (.42**
Engineering, No. 4273, Dec. 19, p. 583.
RIDDLES (R. A.). — The introduction of the « **Cor[o]nation Scot » on the L. M. S. R.** (1 800 words.)

**1947** **6[9]**
Engineering, No. 4273, Dec. 19, p. 590.
The **durability of concrete** exposed to weatherin[g] (1 200 words.)

### Great Western Railway Magazine. (London.)

**1947** **624 .5 (.4**
Great Western Railway Magazine, November, p. 213.
After the floods. How the Great Western enginee[rs] **restored Strangford viaduct.** (1 200 words & fig.)

**1947** **656 .25 (.4**
Great Western Railway Magazine, November, p. 217.
Safety on rail. A new demonstration of the G. W. [R.] **automatic train control** system. (1 200 words & fig.)

### Journal, Institution of Civil Engineers. (London

**1945** **6[9]**
Journal, Institution of Civil Engineers, January, p. 15
COCHRANE (N.). — The economics of **reinforced co[n]crete sections.** (2 400 words & fig.)

**1945** **691 & 62 (**
Journal, Institution of Civil Engineers, February, p. 16
SIMMS (L. G.). — Actual and estimated impa[ct] resistance of some **reinforced concrete units** failing [in] bending. (12 pages, tables & fig.)

**1945** **625 .13 (4**
Journal, Institution of Civil Engineers, February, p. 18
BRIDGE (K. E.). — **Charing Cross railway bridge** temporary repairs to damaged river span. (12 pag[es] & fig.)

**1945** **624 .63 (4**
Journal Institution of Civil Engineers, February, p. 20
HOBBS (N. B.). — The three-pin arch for **reinforce[d] concrete bridges.** (1 800 words.)

## Journal and Proceedings, itution of Mechanical Engineers. (London.)

47 **62 (01 & 669 .1**
eedings Institution of Mechanical Engineers, vol. 157 War Emergency Issue, No. 26).
ARNOCK (F. V.) and POPE (J. A.). — **The ge in mechanical properties of mild steel under ted impact.** (8 200 words & fig.)

47 **62 (01**
eedings Institution of Mechanical Engineers, vol. 157 War Emergency Issue, No. 26).
ANSTOCK (R. F.) and LLOYD (E. H.). — **An y method of measuring poisson's ratio.** (2 200 words .)

## The Locomotive. (London.)

48 **621 .132 .1 (73)**
Locomotive, January 15, p. 1.
years of **Pennsylvania locomotives.** (1 600 words .)

48 **621 .431 .72 (.42)**
Locomotive, January 15, p. 4.
**esel locomotive maintenance.** Derby works, L. M. S. vay. (1 200 words & fig.)

48 **656 .2**
Locomotive, January 15, p. 9.
**e relation of railway technological functions to gement.** (2 000 words.)

48 **621 .132 .3 (44)**
Locomotive, January 15, p. 13.
**-4 locomotives.** French National Railways. (600 s & fig.)

48 **621 .135 .1**
Locomotive, January 15, p. 15.
**comotive frames.** (800 words & fig.)

## Mechanical Engineering. (New York.)

47 **625 .213 (.73)**
anical Engineering, December, p. 1047.
**ilroad stabilizer.** (600 words & fig.)

## Modern Transport. (London.)

47 **625 .232 (.42)**
ern Transport, October 25, p. 16.
**itish railway carriages.** — 42. East Coast practice be continued). (1 200 words & fig.)

47 **621 .138 .4 (.42)**
ern Transport, November 1, p. 15.
**gies and pony trucks.** Important research into behar at high speeds. (500 words.)

47 **656 .251 (.493)**
ern Transport, November 1, p. 17.
**gnalling in Belgium.** Multi-aspects for electrified . (800 words.)

**1947** **621 .138 .1 (.42) & 725 .33**
Modern Transport, November 8, p. 3.
**New locomotive sheds for L. M. S. R.** (1 400 words & fig.)

**1947** **625 .243 (.42)**
Modern Transport, November 15, p. 3.
**Construction of all-steel wagons on L. N. E. R.** Mass production of 13-ton high sided goods wagons. (1 200 words & fig.)

## The Oil Engine and Gas Turbine (London.)

**1947** **621 .431 .72 (42)**
The Oil Engine and Gas Turbine, December, p. 266.
**Shunting locomotive** cost comparisons. Diesel Unit 35 per cent. Cheaper in operation than steam loco. (800 words & fig.)

**1948** **621 .431 .72 (42)**
The Oil Engine and Gas Turbine, January, p. 286.
First British main-line **Diesel locomotive.** (2 600 words & fig.)

**1948** **621 .436 (73)**
The Oil Engine and Gas Turbine, January, p. 294.
CHALKLEY (A. P.). — **Oil-engined rail traction** in America. (1 200 words & fig.)

**1948** **621 .431 .72 (42)**
The Oil Engine and Gas Turbine, January, p. 303.
**Railway traction matters.** (2 800 words & fig.)

**1948** **621 .431 .72 (42)**
The Oil Engine and Gas Turbine, January, p. 318.
The **latest shunting locomotive** Brush 400 b.h.p. Design with Petter engine and electrical transmission. (1 200 words & fig.)

## Proceedings, American Society of Civil Engineers. (New York.)

**1942** **62 (0**
Proceedings, American Society of Civil Engineers, May, p. 683 & 775; June, p. 1067; September, p. 1239; October, p. 1449; November, p. 1649; December, p. 1826.
CORNISH (R.). — Moment balance : A self-checking **analysis of rigidly jointed frames.** (4 000 words). Discussion. (5 800 words & tables.)

**1942** **62 (01**
Proceedings, American Society of Civil Engineers, May, p. 751.
**Physical properties of driven and undriven rivets of high-strength structural steels.** (25 pages, tables & fig.)

## Railway Age. (New York.)

**1947** **625 .232 (.73)**
Railway Age, November 8, p. 41.
**Budd disk brake perfected** to reduce stopping distances. (500 words & fig.)

**1947** **385 (09 (.45)**
Railway Age, November 8, p. 42.
GIORDANO (A.). — **Electric lines being restored in Italy.** (1 000 words & fig.)

---

**1947** **625 .23 (.73) & 625 .24 (.73)**
Railway Age, November 8, p. 44.
SILLCOX (L. K.). — **Future passenger and freight cars.** (2 000 words.)

---

**1947** **621 .335 (.73)**
Railway Age, November 15, p. 195.
**Popularity of Diesel electric grows.** (1 400 words & fig.)

---

**1947** **625 .232 (.73)**
Railway Age, November 15, p. 199.
**Passenger cars.** — A look back and a look ahead. (1 000 words & fig.)

---

**1947** **656 .254 (.73)**
Railway Age, November 15, p. 204.
**Signaling saves the passengers' time.** (1 400 words & fig.)

---

## Railway Engineering and Maintenance. (Chicago.)

**1947** **625 .142 (.73) & 625 .144 .4 (.73)**
Railway Engineering and Maintenance, October, p. 969.
**Ties renewal on large bridge from underneath.** (1 600 words & fig.)

---

**1947** **625 .14 (.73)**
Railway Engineering and Maintenance, October, p. 975.
**Roadmasters study present-day problems** at impressive Chicago meeting. (6 000 words & fig.)

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**1947** **621 .87 (.73) & 625 .245 (.73)**
Railway Engineering and Maintenance, Nov., p. 1099.
**Automatic rail clamps for locomotive cranes.** (700 words & fig.)

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**1947** **624 (06 (.73) & 721 (06 (.73)**
Railway Engineering and Maintenance, Nov., p. 1101.
**Chicago meeting shows B & B group is a potent force.** (16 000 words.)

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**1947** **624 .5 (.73) & 625 .13 (.73)**
Railway Engineering and Maintenance, Dec., p. 1211.
**Rio Grande moves bridge intact.** (600 words & fig.)

---

**1947** **625 .143 .4 (.73)**
Railway Engineering and Maintenance, Dec., p. 1213.
SCHERMERHORN (E. F.). — **Insulated joints.** Their installation and maintenance. (1 400 words & fig.)

---

## Railway Gazette. (London.)

**1947** **621 .431 .72 (.42)**
Railway Gazette, No. 18, October 31, p. 496.
Heavy docks **shunting by Diesel locomotive.** (600 words & fig.)

---

**1947** **656 .254 (.**
Railway Gazette, No. 18, October 31, p. 503.
**New signal aspects for Belgian National Railw**
(500 words.)

---

**1947** **621 .132 .6**
Railway Gazette, No. 19, November 7, p. 518.
**Light tank engines for South America.** (600 w
& fig.)

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**1947** **621 .335 (**
Railway Gazette, No. 19, November 7, p. 519.
**Electric traction** on the Southern Railway. (
words & fig.)

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**1947** **621 .138 .1 (.42) & 725 .33 (**
Railway Gazette, No. 19, November 7, p. 523.
**L. M. S. R. precast reinforced concrete roundh**
**engine sheds.** (1 400 words & fig.)

---

**1947** **625 .164 (**
Railway Gazette, No. 19, November 7, p. 527.
**Protecting water columns from frost.** Southern
way adopts cork lagging as insulation. (100 w
& fig.)

---

## Railway Magazine. (London.)

**1947** **621 .131 .1 (**
Railway Magazine, November-December, p. 344.
NOCK (O. S.). — Recent **locomotive wor**
**L. N. E. R.** (1 200 words & fig.)

---

**1947** **621 .131 .1 (**
Railway Magazine, November-December, p. 390.
ALLEN (C. J.). — **British locomotive practice**
**performance.** (2 200 words.)

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## In Spanish.

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## Ferrocarriles y Tranvias. (Madrid.)

**1947** **38**
Ferrocarriles y Tranvias, agosto, p. 297.
SANDOVAL CAMPDERA (J. M.). — Import
de la organización en la **economía ferroviaria.** (
palabras.)

---

**1947** **625**
Ferrocarriles y Tranvias, agosto, p. 305; septiem
p. 359.
CHARLET (A. L.). — **La regularización de las**
**vas de ferrocarriles** por el método del diagramma d
irregularidades de L. Boudin. (8 000 palabras, cu
& fig.)

---

**1947** **625 .42 (.**
Ferrocarriles y Tranvias, agosto, p. 316.
**La prolongación del « Metro Transversal »** de
celona. (1 000 palabras & fig.)

47 385. (06 .112
carriles y Tranvias, agosto, p. 318.
ociación Internacional del Congreso de los Camin-
le hierro. Cronica de la XIV Sesión de Lucerna.
00 palabras & fig.)

47 625 .28
carriles y Tranvias, septiembre, p. 341.
VARRO GIL (L.). — La tracción en los ferro-
es secundarios y de via estrecha. (4 500 palabras.)

47 385 .1
cariles y Tranvias, septiembre, p. 347.
NDOVAL CAMPDERA (J. M.). — Estudio eco-
co-financiero sobre las explotaciones ferroviarios.
) palabras.)

## sta del Colegio de Ingenieros de Venezuela. (Caracas-Venezuela.)

47 624 .2
ta del Colegio de Ingenieros de Venezuela, nº 163,
nero-febrero, p. 40.
AOLA (J. F.). — Lineas de influencia para vigas
nuas de tramos desiguales sismétricos de intrados
bólico. (1 000 palabras & fig.)

# In Italian.

## Alluminio. (Milano.)

47 62. (01 & 669
ninio, marzo-aprile, p. 101.
NFIGLIOLI (G.). — Osservazioni e risultati
no alla prova di compressione dei materiali metal-
(5 500 parole & fig.)

47 624 (.73) & 669 .71 (.73)
ninio, marzo-aprile, p. 115.
primo ponte costruitó interamente in alluminio.
parole & fig.)

47 669 .71 & 721 .5
ninio, marzo-aprile, p. N. d. 0.31.
cnica della copertura dei tetti in alluminio. (7 000
e & fig.)

## Giornale del Genio Civile. (Roma.)

47 62. (01 & 721 .9
nale del Genio civile, settembre-ottobre, p. 409.
STELLI GUIDI (C.). — Sui margini di sicurezza
strutture in conglomerato precompresso. (3 500
le & fig.)

47 62. (01
nale del Genio civile, settembre-ottobre, p. 414.
ORZI (L.). — Sulla teoria generale dell' instabilita
ica. (3 000 parole & fig.)

## Ingegneria ferroviaria. (Roma.)

**1947** **621 .33 (.45)**
Ingegneria ferroviaria, ottobre, p. 479.
CORBELLINI (G.). — Cinquant' anni di **trazione elettrica** e prospettive della produzione elettrica europea. (1 500 parole.)

**1947** **625 .245 (.45)**
Ingegneria ferroviaria, ottobre, p. 486.
DEL GUERRA (G.). — **Trasporto per ferrovia di gas compressi.** (1 600 parole & fig.)

**1947** **656 .212 .5**
Ingegneria ferroviaria, ottobre, p. 490.
**Motopropulsore leggero per manovre di smistamento.** (300 parole & fig.)

**1947** **621 .431 .72**
Ingegneria ferroviaria, ottobre, p. 491.
MORRA (V.). — Peso d'inerzia di una **automotrice ferroviaria a trasmissione meccanica.** (2 500 parole & fig.)

# In Portuguese.

## Revista das Estradas de ferro (Rio de Janeiro.)

**1947** **385 .113 (.81)**
Revista das estradas de ferro, nº 474, maio, p. 4689.
**O relatório de 1946** da Companhia Paulista de Estradas de Ferro. (2 000 palavras.)

**1947** **621 .133 .1 (.73)**
Revista das estradas de ferro, nº 475, junho, p. 4715.
NONAHAN (A. C.). — **O carvão em pó nas locomotivas** e no aquecimento. (1 000 palavras.)

**1947** **385 .517 .6 (.81)**
Revista das estradas de ferro, nº 476/7, julho-agosto, p. 4746.
**Obra de Assistêcia Social** em favor de 50 000 ferroviários. (2 000 palavras & fig.)

**1947** **656 .25 (.42)**
Revista das estradas de ferro, nº 478, setembro, p. 4786.
TAYLOR (M.). — Progressos na **sinalizacâo ferroviária.** (1 500 palavras.)

# In Dutch.

## Spoor- en Tramwegen. (Utrecht.)

**1947** **621 .132 .1 (.492)**
Spoor- en Tramwegen, nr 17, 14 Augustus, p. 259; nr 18, 28 Augustus, p. 282.
LABRIJN (P.). — De **N C S-locomotieven** van de laatste periode. (7 000 woorden, tabellen & fig.)

**1947** **725 .33**
Spoor- en Tramwegen, nr 18, 28 Augustus, p. 275.
DE BAS (C. A.). — **Stationswaterleidingen.** Moeilijkheden bij vorst en electrificatie. (4 000 woorden & fig.)

**1947** **385 .6**

Spoor- en Tramwegen, nr 18, 28 Augustus, p. 280.

**Internationale organisaties op spoorweggebied.** (1 000 woorden.)

---

**1947** **625 .42 (.42)**

Spoor- en Tramwegen, nr 19, 11 September, p. 293.

PLOMP (A.). — **Grote Londense spoorwegplannen.** (5 000 woorden & fig.)

---

**1947** **621 .33 (.73)**

Spoor- en Tramwegen, nr 19, 11 September, p. 299.

NYMEYER (A. G.). — Twintig jaar **electrisch voorstadverkeer** te Chicago. (1 000 woorden.)

**1947** **385. (09 (**

Spoor- en Tramwegen, nr 19, 11 September, p. 300.

De **toestand van de spoorwegen** in Indonesië. woorden & 1 kaart.)

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**1947** **623 (.437) & 624 (.4**

Spoor- en Tramwegen, nr 19, 11 September, p. 313.

SORBER (J. H. C.). — Opmerkingen over **sp bruggen** in Tsjecho-Slowakije. (5 000 woorden & fig

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**1947** **621 .33 (.4**

Spoor- en Tramwegen, nr 19, 11 September, p. 318.

BAEYENS (F.). — De **electrificatie** der Belgi spoorwegen. (1 400 woorden & fig.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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## I. — BOOKS.

### In French.

**947** **698**

**ssai de définition de la bonne exécution et de la limite ure des peintures sur les ouvrages en acier.**

aris. publié par l'Office technique pour l'Utilisation l'Acier. 25. rue du Général Foy. 1 brochure ×27 cm.) de 34 pages et planches en couleurs.

**947** 621 .132 .1 (.44)

**ocomotives des Chemins de fer français. A vapeur-riques-Diesel-électriques et autorails.**

aris (17e), Editions P. P. C., 39, boulevard Berthier. bum (15×24 cm.) de 68 pages et nombreuses plan- illustrées. (Prix : 250 fr. français.)

**944** **669 .71**

**otions pratiques sur le chaudronnage de l'aluminium le ses alliages.**

aris. L'Aluminium français, 23bis, rue de Balzac. ochure (10×14 1/2 cm.) de 40 pages, illustrée.

**947** 385. (08 (.493)

FICE D'EXPLOITATION DES TRANSPORTS CO-ONIAUX (OTRACO).

**apport 1946**

ruxelles, O.T.R.A.C.O., 101, avenue Louise. 1 volume 5×29.5 cm.) de 70 pages, avec de nombreux tableaux, phiques et illustrations hors-texte.

### In English.

**944** 656 .25 (73)

**SOCIATION OF AMERICAN RAILROADS (A.A. R.). Signal Section.**

**ommittee reports 1944 fiscal year. — Rules of order. Result of 1944 letter ballot.**

ew York, N. Y., published by the Signal Section, A. R., 30, Vesey Street. A volume of 232 pages. strated.

**1946** **656 .25 (73)**

**ASSOCIATION OF AMERICAN RAILROADS (A.A. R.). Signal Section.**

**Proceedings. Minutes 48th. Annual Meeting,** Swampscott, Mass., October 14, 15 and 16, 1946.

New York, N. Y., published by the Signal Section, A.A.R., 30, Vesey Street. A volume of 160 pages. Illustrated.

**1947** **656 .25 (73)**

**ASSOCIATION OF AMERICAN RAILROADS (A.A. R.). Signal Section.**

**Reports to be presented at the forty-ninth Annual Meeting, Chicago. Ill. September 11, 12 and 13, 1947. — Rules of order. — Result of 1946 letter ballot.**

New York, N. Y., published by the Signal Section, A.A.R., 30, Vesey Street. A volume of 321 pages. Illustrated.

**1948** **385 (09 (.42)**

**CRUMP (N.).**

**By rail to Victory.**

London : Published by the former London and North Eastern Railway, Blendford Square, N. W. 1. (Price : 7s.6d.)

**1947** **669**

**DUDLEY (L.).**

**Light metal in structural engineering.**

London : Published for Temple Press Ltd, by the English Universities Press Ltd, London E. C. 4. Cloth, 5 1/2×8 3/4 in., 216 pages, diagrams, charts, tables. (Price : 30s.)

**1948** **621 .132 .1 (.42)**

**The locomotives of the Southern Region of British Railways. 1948.**

London : Compiled and published by W. G. Tilling, 106, Great Dover Street, S. E. 1. (8 1/2×5 1/2 in.) 84 pages. Illustrated. Paper covers. (Price : 5s.)

**1947** **313 .385 (.42)**

**Railway Statistics, 1938-1946.**

London : Railway Clearing House, 203, Eversholt Street, N. W. 1. (Price : 2s/— net.)

**1947** **669**

**ROBERTS (J. A.).**

**Spring design and calculations.**

Technical Research Laboratory, Herbert Terry and Sons Ltd, Redditch, England. Cloth, 4 3/4×7 1/2 in., 114 pages, illus., diagrams, charts, tables. (Price : 10s.6d.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress con- tly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway nce », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509)

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## II. — PERIODICALS.

### In French.

#### Bulletin de l'Union Internationale des Chemins de fer. (Paris.)

**1947** **385 .1 (.43)**
Bulletin de l'Union Internationale des Chemins de fer, octobre, p. 294.
**Situation financière** des Chemins de fer allemands. (1 500 mots.)

**1947** **621 .33 (.493)**
Bulletin de l'Union Internationale des Chemins de fer, octobre, p. 296.
**L'électrification** des Chemins de fer belges (3 500 mots & carte.)

**1947** **385. (09 .3 (.489)**
Bulletin de l'Union Internationale des Chemins de fer, octobre, p. 301.
TORK. — Le **centenaire des Chemins de fer de l'Etat danois.** (14 000 mots.)

**1947** **621 .33 (.44)**
Bulletin de l'Union Internationale des Chemins de fer, octobre, p. 313.
GARREAU. — **L'état actuel de l'électrification** en France. Lignes exploitées par la S.N.C.F. (3 000 mots & tableaux.)

**1947** **385. (09 (.481)**
Bulletin de l'Union Internationale des Chemins de fer, octobre, p. 318.
HVOSLEF (F.). — Le **Chemin de fer du Nordland.** (2 000 mots & carte.)

**1947** **385 .113 (.71)**
Bulletin de l'Union Internationale des Chemins de fer, octobre, p. 321.
Les **deux grands réseaux du Canada** en 1946. (1 600 mots & tableaux.)

**1947** **625 .15 (.44)**
Bulletin de l'Union Internationale des Chemins de fer, octobre, p. 329.
**Modernisation des appareils de voie** de la S.N.C.F. (1 000 mots & fig.)

#### Bulletin des Transports internationaux par chemins de fer. (Berne.)

**1948** **385 .62 & 385 .63**
Bulletin des transports internationaux par chemins de fer, janvier, p. 7.
EGER (G.). — Le « **Transport Act 1947** ». **Sa signification par rapport à la C.I.M. et la C.I.V.** (6 000 mots.)

#### Bulletin technique de la Suisse romande (Lausanne.)

**1948** **621 .132 .5 (**
Bulletin technique de la Suisse romande, 14 fév p. 40.
BAUMGARTNER (J. P.). — La **locomotive « guerre » lourde allemande,** Série 42. (2 500 mots & f

#### Génie Civil. (Paris.)

**1948** **691 & 72**
Génie Civil, nº 3221, 15 janvier, p. 21.
LEVIANT (I.), DE LA SAYETTE (E.) et S BAING (J.). — Le **béton** sous vide. (3 000 mots & f

**1948** **62. (01 & 72**
Génie Civil, nº 3221, 15 janvier, p. 31.
DEGUILLAUME (R.). — Appareil d'essai rapid sur place de la **résistance des terrains de fondation.** (1 mots & fig.)

**1948** **625 .144 .1 & 665 .**
Génie Civil, nº 3221, 15 janvier, p. 33.
Les progrès récents dans la **soudure aluminothermi des rails.** (1 000 mots & fig.)

#### Revue de l'Aluminium (Paris).

**1947** **669 &**
Revue de l'Aluminium, novembre, p. 345.
Nouvelles **Journées de la Corrosion et de la Mé lurgie,** Paris (octobre 1947). (3 000 mots.)

#### Revue générale des chemins de fer. (Paris.)

**1947** **625**
Revue générale des chemins de fer, novembre, p. 361.
**La technique des engins de traction. Tendan actuelles.**
Tendances actuelles : en **Grande-Bretagne,** d'après exposés de MM. O. V. S. BULLEID, F. W. HAWI WORTH, H. V. IVATT et A. H. PEPPERCORN; **Etats-Unis d'Amérique,** d'après l'exposé de M. P. KIEFER ; en **Europe continentale,** par M. L. ARMAN (15 000 mots, tableaux & fig.)

**1947** **625 .141 (.4**
Revue générale des chemins de fer, novembre, p. 383.
BOUCHER (R.). — **La tenue des voies à la tête faisceau de la Gare de Paris-Nord.** (1 500 mots & fi

47 621 .431 .72 (.44)
ue générale des chemins de fer, novembre, p. 386.
PPIER et GUIN. — Utilisation des **locomotives el-électriques de manœuvre Baldwin** dans les gares Iarseille-Arenc et de Miramas. (4 000 mots & fig.)

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947 625 .212 (.44)
ue générale des chemins de fer, novembre, p. 392.
nstruction pour la S.N.C.F. de rames de **voitures à geurs montées sur pneumatiques.** (1 000 mots & fig.)

---

947 621 .132 .3 (.44)
ue générale des chemins de fer, décembre, p. 397.
HAPELON (A.). — La **locomotive 242-A-1** de la C.F. Locomotive à grande vitesse, à bogie, 4 essieux uplés et bissel AR à 2 essieux. Compound à 3 cylin-, haute surchauffe, large circuit de vapeur.

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## Science et Vie. (Paris.)

948 656 .211 .7
nce et Vie, janvier, p. 215.
E MASSON (H.). — Les **ferry-boats.** (4 000 mots g.)

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948 621 .335
nce et Vie, janvier, p. 252.
LOCH (G.). — Un **nouveau mode de traction électri- L'électrogyro.** (1 500 mots & fig.)

---

## La Technique moderne. (Paris.)

947 62. (01 & 669
Technique moderne, 1er et 15 décembre, p. 381.
ASTIEN (P.) et POPOFF (A.). — **Essais de dureté.** uence de l'état géométrique de surface. (2 000 mots g.)

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947 69
Technique moderne, 1er et 15 décembre, p. 390.
ASCAL (R.). — Les **méthodes modernes de construc-.** Evolution et tendances. (4 000 mots & fig.)

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# In English.

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## Engineer. (London.)

945 621 .132 .1 (.42)
ineer, Jan. 12, p. 28.
**team locomotives of 1944.** (1 800 words & fig.)

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945 621 .431 .72 (.42)
ineer, Feb. 2, p. 84; Feb. 9, p. 104; Feb. 16, p. 124; Feb. 23, p. 144; March 2, p. 166.
EED (B.). — The **railway oil engine.** (15 000 words g.)

1945 625 .14 (.42)
Engineer, Feb. 2, p. 90.
**An unusual track grading operation.** (1 400 words & fig.)

---

1945 656 .1 (.42) & 656 .2 (.42)
Engineer, Jan. 26, p. 78; Feb. 2, p. 98.
SHEARMAN (J.). — **Road and rail conjecture.** (4 000 words & tables.)

---

1945 625 .212 (.73)
Engineer, Feb. 9, p. 111.
Production of **tubular railway axles in America.** (800 words & fig.)

---

1945 621 .132 .1 (.42)
Engineer, May 4, p. 348; May 11, p. 367.
POULTNEY (E. C.). — **Eight coupled locomotives on British Railways.** (4 800 words & fig.)

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## Journal, Institution of Civil Engineers. (London.)

1945 625 .2 (01
Journal, Institution of Civil Engineers, November, p. 69.
BRIDGMAN (R.). — The **effect of conical wheels and gauge-widening on the motion of railway vehicles around curves.** (2 800 words & fig.)

---

1946 625 .42 (42)
Journal, Institution of Civil Engineers, March, p. 6.
GROVES (G. L.). — **The Ilford Tube.** (40 pages & fig.)

---

1947 669 .1
Journal, Institution of Civil Engineers, December, p. 138.
VIVIAN (A. C.). — **Percentage elongation of steel.** (10 pages & fig.)

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## Mechanical Engineering. (New York.)

1948 621 .133 .7 (.73)
Mechanical Engineering, January, p. 28.
**Acid-cleaning boilers.** (1 400 words.)

---

## Modern Transport. (London.)

1947 385 .4 (.42)
Modern Transport, November 15, p. 9.
POPE (F. A.). — **Principles of large scale organisation.** (1 800 words and chart.)

---

1947 621 .138 .1 (.42) & 721 .5 (.42)
Modern Transport, November 15, p. 11.
**Re-roofing of engine sheds.** Use of precast reinforced concrete. (1 100 words & fig.)

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1947 621 .335 (.41)
Modern Transport, November 15, p .18.
**C.I.E. Diesel-electric locomotives.** (400 words & fig.)

1947 621 .132 .3 (.42)
Modern Transport, November 22, p. 5; January 24, p. 7.
POULTNEY (E. C.). — **Landmarks of express locomotive progress.** — 7. — The keystone of the arch. (Continued.) (3 500 words & fig.)

1947 385 .4 (.42)
Modern Transport, November 29, p. 3.
**New organisation for British railways.** Statement by Sir Cyril Hurcomb. (1 800 words & map.)

1947 621 .132 .5 (.73)
Modern Transport, November 29, p. 4.
POULTNEY (E. C.). — **New Mallet type steam locomotives.** (1 400 words & fig.)

## The Oil Engine and Gas Turbine. (London.)

1948 621 .431 .72 (42)
The Oil Engine and Gas Turbine, January, p. 322.
BENNETT-POWELL (J. A.). — **New 500/600 B.H.P. Diesel mechanical locomotive.** (1 200 words & fig.)

## Railway Age. (New York.)

1947 621 .31 (.73)
Railway Age, November 15, p. 213.
**Electrical needs and accomplishments.** (1 200 words & fig.)

1947 656 .254 (73)
Railway Age, November 22, p. 33.
**C.T.C. down by the Ohio.** (1 400 words & fig.)

1947 625 .235 (73)
Railway Age, November 22, p. 36.
GOGERTY (J.). — **Accessories on new passenger cars.** (1 200 words.)

1947 621 .431 .72 (81)
Railway Age, November 22, p. 43.
BILL (E. M.). — **Brazil adds Diesels to its Electrics.** (1 200 words & fig.)

1947 625 .26 (.73)
Railway Age, November 29, p. 34.
**New Missouri Pacific freight car shop** designed for rapid production. (1 400 words & fig.)

1947 621 .431 .72 (.73)
Railway Age, November 29, p. 45.
HATCH (P. H.). — **Operating traits of Diesel locomotives.** (900 words.)

1947 625 .251
Railway Age, December 6, p .50.
HAYS (L. D.). — How **wheels behave on low adhesion rail.** (1 400 words.)

1947 385 (09 (42)
Railway Age December 6, p. 52.
WILSON (G. L.). — British Transport Nationalization. Genesis and program. (3 200 words.)

1947 625 .232 (
Railway Age, December 6, p. 69.
**Stabilizer for passenger cars.** (500 words & fig.)

1947 625 .24 (
Railway Age, December 13, p. 50.
STUEBING (A. F.). — **Economics of lightwei freight cars.** (3 000 words & fig.)

1947 625 .232 (
Railway Age, December 20, p. 44.
**New comfort for New England passengers.** (2 words & fig.)

1947 625 .26 (
Railway Age, December 20, p. 50.
Northern Pacific has **assembly-line car shop** at Br erd. (1 600 words & fig.)

1947 624 .62 (
Railway Age, December 27, p. 32.
**Santa-Fe again tames Canyon Diablo.** (2 400 wo & fig.)

1947 625 .232 (
Railway Age, December 27, p. 40.
**Wabash installs « City of Kansas City ».** (3 000 wo & fig.)

## Railway Engineering and Maintenance. (Chicago.)

1948 625 .17 (.
Railway Engineering and Maintenance, January, p.
**Some « tips » on the latest use of oxyacetylene fl in track work.** (2 800 words & fig.)

## Railway Gazette. (London.)

1947 625 .
Railway Gazette, No. 20, November 14, p. 546.
The **proportioning of brake blocks.** (600 words.)

1947 625 .1 (.
Railway Gazette, No. 20, November 14, p. 554.
**A Pennsylvania railroad relocation.** (500 words & f

1947 621 .132 .3 (.
Railway Gazette, No. 20, November 14, p. 555.
Sectioned perspective views **of L.M.S.R. 4-6-0** conve « Royal Scot » express locomotive. (800 words & fig

1947 625 .242 (.
Railway Gazette, No. 20, November 14, p. 557.
**New lightweight wagons in France.** (400 words & f

1947 691 (.
Railway Gazette, No. 20, November 14, p. 558.
**G.W.R. taunton concrete depot.** (800 words & fig.)

947 621 .133 .1 (.42)
way Gazette, No. 20, November 14, p. 569.
.W.R. **oil fuel depot at Old Oak.** (400 words & fig.)

947 621 .138 .1 (.85)
way Gazette. No. 21, November 21, p. 583.
**powerful freight locomotive for Peru.** (1 400 words
g.)

947 656 .256 .1 (.42)
way Gazette, No. 21, November 21, p. 585.
**ew block telegraph instrument for G.W.R.** (1 000
ds & fig.)

947 625 .232 (.42)
lway Gazette, No. 21, November 21, p. 588.
**ainless-steel prototype composite coach.** (1 200 words
g.)

947 385 .4 (.42)
lway Gazette, No. 22, November 28, p. 603.
**ooking back on grouping.** (1 200 words & maps.)

947 385 .4 (.42)
lway Gazette, No. 22, November 28, p. 608.
**ritish Transport Commission: Railway organisation.**
00 words & map.)

947 656 .25 (.42)
lway Gazette, No. 22, November 28, p. 614.
.T.C. **demonstration on G.W.R.** (1 400 words & fig.)

## Railway Mechanical Engineer. (New York.)

947 621 .138 .5 (.73) & 621 .9 (.73)
lway Mechanical Engineer, October, p. 580.
**'he Locomotive officer's meeting.** 5th Annual meeting.
400 words & fig.)

1947 621 .138 .3 (.73) & 621 .335 (.73)
lway Mechanical Engineer, October, p. 593.
**lectric locomotive washer.** (800 words & fig.)

1947 656 .254 (.73)
ilway Mechanical Engineer, October, p. 595.
**'ower for train communication.** (1 400 words & fig.)

1947 621 .3 (063
ilway Mechanical Engineer, November, p. 615.
**lectrical sections of A.A.R. hold annual meetings in
icago.** (25 pages.)

1947 621 .133 .1 (.73)
ilway Mechanical Engineer, November, p. 638.
MOSHER (F. D.). — **Combustion air for fireboxes.**
100 words & fig.)

1947 621 .133 .3 (.73)
ilway Mechanical Engineer, November, p. 642.
**The cracking of boilers.** (2 000 words & fig.)

1947 625 .26 (.73)
ilway Mechanical Engineer, November, p. 651.
**Maintenance of passenger-car trucks.** (2 400 words
fig.)

## In Spanish.

### Boletin de la Asociación Permanente del Congreso Panamericano de Ferrocarriles. (Buenos Aires.)

1947 385 .113 (.82)
Boletin de la Asociación Perm. del Congreso Panameric. de Ferrocarriles, julio-agosto, p. 41.
CABLE (R. V.). — **El analisis sistematico de costos de los distintos servicios ferroviarios** con el proposito de determinar los resultados economicos de cada uno de estas. (8 000 palabras & cuadros.)

1947 656 .222 .5 (.82)
Boletin de la Asociación Perm. del Congreso Panameric. de Ferrocarriles, julio-agosto, p. 61.
BARRES (F.). — **Transportes en la Capital y sus** alrededores. (Buenos-Aires.) (3 500 palabras & fig.)

1947 621 .133 .1 (.82)
Boletin de la Asociación Perm. del Congreso Panameric. de Ferrocarriles, julio-agosto, p. 73.
**Consumo ferroviario de combustibles** en 1946 y su comparacion con 1945. (Argentina.) (1 700 palabras & cuadros.)

1947 621 .33 (.3)
Boletin de la Asociación Perm. del Congreso Panameric. de Ferrocarriles, septiembre-octubre, p. 46.
Los **principales ferrocarriles electricos** en el mundo. (1 200 palabras & cuadro.)

1947 625 .23 & 669 .1
Boletin de la Asociación Perm. del Congreso Panameric. de Ferrocarriles, septiembre-octubre, p. 49.
WILLIAMS (H. H.). — Nueva tecnica en el material para coches de pasajeros. El **acero inoxidable.** (6 000 palabras & fig.)

### Revista de Obras Públicas. (Madrid.)

1948 624 .63 (.460)
Revista de Obras Publicas, enero, p. 25.
SANTOLARIA (E.). — **El puente, la presa y el rio.** Cimentaciones por aire comprimido del nuevo puente para la R.E.N.F.E. en Castronuño (Valladolid). (2 600 palabras & fig.)

## In Italian.

### Alluminio. (Milano.)

1947 621 .82 & 669 .71
Alluminio, maggio-guigno, p. 229.
**Le leghe di alluminio come materiali antifrizione.** (2 000 parole & tabelle.)

**1947** **665 .882**
Alluminio, maggio-giugno, p. N.d.O, 65.
I principî della **saldatura ossiacetilenica delle leghe leggere.** (10 000 parole, tabelle & fig.)

## L'Ingegnere. (Milano.)

**1947** **621 .33 (.45)**
L'Ingegnere, marzo, p. 181.
ZATTONI (T.). — Orientamenti sui **futuri sviluppi della elettrificazione** della rete delle F.S. italiane. (2 600 parole & fig.)

**1947** **624 .32 (.45)**
L'Ingegnere, marzo, p. 205.
TETTAMANZI (G.). — **Ripristino del ponte ferroviario** di Cremona sul fiume Po. (3 000 parole & fig.)

## Ingegneria ferroviaria. (Roma.)

**1947** **624 .2**
Ingegneria ferroviaria, ottobre, p. 495; novembre, p. 571; dicembre, p. 683.
DE NARDIS (M.). — Determinazione dei **massimi effetti in travi iperstatiche** soggette a treni di carichi mobili. (7 000 parole & fig.)

**1947** **625 .2 : 625 .62 (.45)**
Ingegneria ferroviaria, ottobre, p. 503.
Una **nuova vettura tramviaria** per Roma. (500 parole & fig.)

**1947** **656 (.45)**
Ingegneria ferroviaria, ottobre, p. 505.
SANTORO (F.). — Necessità presenti en preoccupazioni pel futuro nel problema della **concorrenza automobilistica.** (2 700 parole.)

# In Dutch.

## Spoor- en Tramwegen. (Utrecht.)

**1946** **621 .392 (.492) & 625 .212 (.492)**
Spoor- en Tramwegen, Nr 18, 6 Juni, p. 205.
TABERNAL (W. F. H.). — Het **electrisch oplasschen van wielflenzen.** (3 500 woorden & fig.)

**1946** **621 .335 (.494)**
Spoor- en Tramwegen, Nr 18, 6 Juni, p. 210.
De eerste na den oorlog in Zwitserland in dienst gestelde **electrische locomotiven.** (700 woorden & fig.)

**1947** **625 .112 (.92)**
Spoor- en Tramwegen, Nr 21, 9 October, p. 323; Nr 22, 23 October, p. 544.
REITSMA (S. A.). — Een en ander over spoorwijdten, meer in het bijzonder over de **toepassing van « smalle » spoorwijdten** in Nederlands-Indië. (11 000 woorden & fig.)

**1947** **385. (09 (.4**
Spoor- en Tramwegen, Nr 21, 9 October, p. 332.
FUCHS (J. M.). — De **Spoorwegen in Italië.** (3 0
woorden & fig.)

**1947** **656 (.**
Spoor- en Tramwegen, Nr 21, 9 October, p. 334.
**Spoorweg/Luchtweg** in West-Europa. (2 500 woord
& fig.)

**1947** **656 .253 (.9**
Spoor- en Tramwegen, Nr 22, 23 October, p. 339.
JONKER (J. C.). — Het **seinbeeld** van het eenvoudi
Indische station. (3 000 woorden & fig.)

**1947** **621 .335 (.7**
Spoor- en Tramwegen, Nr 22, 23 October, p. 347.
NYMEYER (A. G.). — **Electrische reuzenlocomot**
voor de Virginian Railway (U. S. A.). (1 200 woord
& fig.)

**1947** **625 .236 (.7**
Spoor- en Tramwegen, Nr 22, 23 October, p. 349.
**Reiniging van rijtuigen** bij de Union Pacific Railroa
(1 000 woorden & fig.)

**1947** **656 (.4**
Spoor- en Tramwegen, Nr 22, 23 October, p. 350.
Frankrijks spoorwegen bestudeeren het **luchtvrac**
**vervoer.** (1 200 woorden & tabel.)

**1947** **385. (09 (.9**
Spoor- en Tramwegen, Nr 23, 6 November, p. 357.
BEEK (J. W. J.). — Enige **mededelingen over**
**Spoorwegen op Java.** (Periode Augustus 1945-Juli 194
(4 000 woorden & fig.)

# In Polish (= 91.885.)

## Przeglad Komunikacyjny. (Warsaw.)

**1947** **656 .213 = 91 .8**
Przeglad Komunikacyjny, No. 9-10, p. 286.
BEISTER (K.). — Problem of **relations between po**
**and railway.** (5 500 words.)

**1947** **625 .2 (.73) = 91 .8**
Przeglad Komunikacyjny, No. 9-10, p. 307.
JURASZ (K. O.). — Some observations concerning t
actual and futur **rolling stock management** on the U.S.
railways. (8 000 words.)

**1947** **621 .13 (.73) = 91 .8**
**& 621 .132 .5 (.438) = 91 .8**
Przeglad Komunikacyjny, No. 9-10, p. 322.
WASILEWSKI (G.) & FIJALKOWSKI (J.). — Te
dencies in the construction of **American locomotives** a
concise description of the **1-5-0 type locomotives,** pu
chased in U. S. A. for the Polish State Railways. (2 5
words & fig.)

**)47** **621 .13 (.438) = 91 .885**
glad Komunikacyjny, No. 9-10, p. 327.
:MBRZUSKI (K.). — Guiding principles for the truction of **standardized locomotives** for the Polish e Railways. (12 000 words, tables & fig.)

**)47** **621 .13 (.438) = 91 .885**
glad Komunikacyjny, No. 11, p. 355.
JALKOWSKI (J.). — **Standardized locomotives** for Polish State Railways. (3 500 words & fig.)

**)47** **621 .134 .2 = 91 .885**
glad Komunikacyjny, No. 11, p. 367.
ANGROD (A.). — Baker's **valve gear.** (1 200 words g.)

## In Portuguese.

### Técnica. (Lisboa.)

**)47** **621 .32**
ica, nº 175, junho, p. 465.
AIS GROMICHO (J. N.). — Algo sobre **lâmpadas rescentes.** (8 000 palavras, quadros & fig.)

## In Swedish. (= 439.71.)

### Nordisk Järnbanetidskrift. (Stockholm.)

**1947** **656 .222 .1 (.48) = 439 .5**
Nordisk Järnbanetidskrift, No. 10, p. 289.
TÖRNQVIST (L.). — The effect of **train speeds** on the economy. Lecture at the ordinary session at Copenhagen. (1 950 words & fig.)
ANDERSEN. — Danish report. (1 700 words.)
AAMODT (A.). — Norwegian report. (600 words.)
SJÖBERG (A.). — Swedish report. (1 000 words.)

**1947** **656 .254 (.42) = 439 .71**
Nordisk Järnbanetidskrift, No. 10, p. 305.
HARD (T.). — **Safety devices at grade crossings** in England. (1 500 words & fig.)

**1947** **313 : 385 .5 (.47 .1) = 439 .72**
Nordisk Järnbanetidskrift, No. 10, p. 310.
ARPOKARI (Y.). — New **statistic of the Finnish railway personnel.** (1 300 words.)

**1947** **621 .3 & 656 .2 = 439 .71**
Nordisk Järnbanetidskrift, No. 11, p. 315.
THELANDER (Th.). — **Working of the railways** and the **electrotechnics.** (4 500 words.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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## I. — BOOKS.

### In French.

48 — 531 (02

HIN (H.).

**urs de mécanique. Tome I.**

ris, Gauthier-Villars, éditeur. 5 volumes (21 × 31 mètres) de 602 pages, avec 218 figures. Edition pro-re polycopiée. (Prix : 1 800 fr. français.)

48 — 691

ARD (A.).

**ton armé, flexion simple. Nouveaux abaques :** étré des aciers et section économique des armatures ues et comprimées, des étriers, nervures, hourdis et res.

ris, en vente chez l'auteur, 44, rue Paul-Barruel. abaques (21×31 cm.). (Prix de chaque abaque : fr. français.)

47 — 53 & 62. (01

MANS (E.).

**ézo-électricité, théorie et pratique.**

ris, éditeur : Eyrolles, 61, boulevard Saint-Germain. olume (15×21 cm.) de 164 pages. (Prix : broché, fr. français.)

48 — 624 (02

LETTE (R.)

**nstruction des Ponts.** Evolution — étude, art et **ce du pont — exécution — épreuves. 2e édition.**

ris, Dunod, éditeur. 1 volume (13×21 cm.) de X — pages, avec 81 figures. (Prix : broché, 340 fr. franç.)

### In English.

47 — 385 (591)

**nnual report of the Burma Railway Board. - 1946-47.**

ngoon : printed at The Asiatic Press. A brochure /4×13 in.) of 58 pages, tables and diagrams.

1948 — 625 .232

BURTT (F.) and BECKERLEGGE (W.).

**Pullman and perfection.**

London : Ian Allan Ltd., 282, Vauxhall Bridge Road, S.W.1. (Price : 1s.9d.)

1947 — 656 .1 (68)

**Report of the commission of imquiry into road motor transportation (1945).**

Pretoria : printed in the Union of South Africa, by the Government printer. A volume (7 7/8"×1'1") of 184 pages and map.

1947 — 385 (59)

SANDERS (J. O.)

**Malayan Union, Railways report for the period 1st April to 31st December 1946.**

Kuala Lumpur : printed at the Malayan Union Government Press, by H. T. Ross, Government printer. A brochure (5 1/2 × 9 7/8 in.) of 99 pages, illustrated. (Price : $ 1 50 or 3s.6d.)

1948 — 621 .132 .1 (.42)

WEIGHT (R. A. H.).

**Great Northern Locomotives, 1847-1947.**

Hastings, Sussex : R. A. H. Weight, 198, St-Helens Road. (Price : 4s.6d., postage extra.)

### In Italian.

1948 — 691 & 721 .9

SANTARELLA (L.).

**Il cemento armato. Vol. II : Le applicazioni alle costruzioni civile e industriali.** XI edizione rifatta.

Milano, U. Hoepli, éditore. 1 vol. in-8° di pagine XVI — 632, con 524 figure.

1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress con ly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway ce », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

[ 016. 385. (05 ]

## II. — PERIODICALS.

### In French.

#### Annales des Ponts et Chaussées. (Paris.)

**1947** — **691 & 721 .9**

Annales des ponts et chaussées, juillet-août, p. 471.
BAUDELAIRE (J.) et BOULLOCHE (A.). — Une nouvelle technique américaine du **béton coulé sous l'eau.** (9 000 mots, tableaux & fig.)

**1947** — **624 .2**

Annales des ponts et chaussées, juillet-août, p. 521.
ROBINSON (J. R.). — Etat élastique de l'**appui d'une poutre continue.** (2 500 mots & fig.)

#### Annales des Travaux publics de Belgique. (Bruxelles.)

**1947** — **624 .2**

Annales des Travaux publics de Belgique, octobre, p. 551; décembre, p. 665.
BLANJEAN (L.). — Résolution des **systèmes hyperstatiques plans** constitués par une chaîne ouverte de mailles fermées quelconques à assemblages rigides, chaîne telle que l'ouverture de toutes les mailles rend l'ensemble isostatique. (27 000 mots, tableaux & fig.)

#### Electricité. (Paris.)

**1947** — **621 .431 .72**

Electricité, octobre, p. 195.
Le **réglage électro-hydraulique de groupes diesel-électriques.** (1 500 mots & fig.)

**1947** — **691 & 694**

Electricité, octobre, p. 199.
DERIBERE (M.). — **Séchage du bois par rayonnement infra-rouge.** (1 100 mots, tableaux & fig.)

**1947** — **656 .254**

Electricité, novembre, p. 214.
La **T.S.F. dans l'exploitation des chemins de fer.** (1 100 mots.)

#### L'Industrie des voies ferrées et des transports automobiles. (Paris.)

**1947** — **625 .41**

L'Industrie des Voies ferrées et des Transports automobiles, octobre, p. 150.
REBUFFEL (A.). — Caractéristiques des **téléfériques** et aménagement des cabines. (2 000 mots & fig.)

**1947** — **625 .41 (.**

L'Industrie des Voies ferrées et des Transports auto[mo]biles, octobre, p. 153.
Exposé sur les travaux du **téléférique** de l'Aiguille [du] Midi (3e tronçon) à Chamonix. (3 300 mots.)

**1947** — **625**

L'Industrie des Voies ferrées et des Transports auto[mo]biles, octobre, p. 156.
RUMILLY (A.). — Divers **moyens de remontée m[éca]nique** pour voyageurs en montagne. (3 500 mots & f[ig.)]

**1947** — **625**

L'Industrie des Voies ferrées et des Transports auto[mo]biles, octobre, p. 163.
SERVANT. — Caractéristiques générales des **chem[ins] de fer de montagne.** (3 000 mots.)

#### L'Ossature métallique. (Bruxelles.)

**1947** — **624 .2 (.493) & 625 .1 (.4**

L'Ossature métallique, novembre, p. 471.
VERDEYEN (J.). — Utilisation de **poutres mét[alli]ques évidées et soudées pour la réalisation du via[duc] Nord** de la jonction Nord-Midi à Bruxelles. (6 000 m[ots,] tableaux & fig.)

**1947** — **691 (.493) & 698 (.4**

L'Ossature métallique, novembre, p. 482.
LAGASSE (J.). — **Résultats des essais de corro[sion] atmosphérique** de longue durée sur aciers protégés [par] peinture, exécutés en Belgique. (2 500 mots & fig.)

#### Revue de l'Association française des Amis des Chemins de fer. (Paris.)

**1947** — **385. (09 (.**

Revue de l'Ass. fr. des amis des Ch. de fer, n° [...] mai-juin, p. 49.
Baron VUILLET et CAIRE (D.). — Les **chemins [de] fer britanniques** et l'après-guerre. (5 000 mots & fig.)

**1947** — **625 .1 (.**

Revue de l'Ass. fr. des amis des Ch. de fer, n° [...] mai-juin, p. 59.
DESNUES (G.). — La **section Brive-Cahors** de la li[gne] de Paris à Toulouse. (2 500 mots, 2 tableaux & fig.)

**1947** — **621 .132 .3 (.**

Revue de l'Ass. fr. des amis des Ch. de fer, n° [...] mai-juin, p. 64.
VILAIN (L. M.). — Un **projet de locomotive à gra[nde] vitesse, type « Atlantic »** à deux chaudières, de la C[om]pagnie d'Orléans (1897). (1 700 mots, tableau & fig.)

## levue générale des chemins de fer. (Paris.)

948 625 .154 (.44)
ue générale des chemins de fer, janvier, p. 1.
EVI (R.). — **Nouvelles rotondes à machines** de la .C.F. (2 000 mots & fig.)

948 656 .222 .6 & 656 .235
ue générale des chemins de fer, janvier, p. 5.
IERMET et MEYER. — **La reprise du trafic inter-ional des marchandises.** (6 000 mots.)

948 625 .13 (.44 + .45)
ue générale des chemins de fer, janvier, p. 13.
IMON et TARDY. — **Le rétablissement de la ligne** oz—Frontière d'Italie dans la Vallée de la Maurienne. 000 mots & fig.)

948 656 .257 (.44)
ue générale des chemins de fer, janvier, p. 21.
UBOUDIN et MICHAUX. — **Le nouveau poste élec-ue d'aiguillage** des raccordements de Darnétal. (2 600 ts & fig.)

948 625 .232 (.44) & 656 .25 (.44)
ue générale des chemins de fer, janvier, p. 29.
APLAICHE et NOULETTE. — **La voiture de service** 515 de la Région du Nord. Ses caractéristiques et son ctionnement. (3 500 mots & fig.)

1948 625 .234 (.44)
vue générale des chemins de fer, janvier, p. 34.
e **chauffage par air pulsé** des nouvelles voitures de la .C.F. (250 mots.)

## La Route du Rail. (Paris.)

1947 656 .25 (.44)
Route du Rail, janvier, p. 5.
Évolution et progrès de la **signalisation** dans les Che-ns de fer français. (2 000 mots & fig.).

1947 656 .254 (.494)
Route du Rail, janvier, p. 15.
FELBER (E.). — Les **appareils d'arrêt automatique** le réseau C.F.F. (1 500 mots & fig.)

1947 385. (09 .3 (.44)
Route du Rail, février, p. 1; mars, p. 1.
LARTILLEUX (H.). — **Historique de la Région du d-Est** de la S.N.C.F. (ex-réseau P.L.M.). (7 000 mots fig.)

1947 656 .254 (.44)
Route du Rail, février, p. 5.
Le **rail et les ondes.** Les liaisons radiotéléphoniques de gare de triage de Trappes (Région S.O.). (1 500 mots fig.)

1947 625 .112
Route du Rail, février, p. 7.
COLNAT (A.). — L'**écartement** des voies ferrées 500 mots.)

## In English.

### Bulletin, American Railway Engineering Association. (Chicago.)

1947 625 .142 (73) & 625 .144 .4 (73)
Bulletin, American Railway Engineering Association, vol. 49, No. 470, December, pp. 147, 177 & 237.

**Report of Committee 27. — Maintenance of Way work equipment:** Power ballasting machines; Snow removal equipment; Power cribling machines; Power spike machines; Flame cleaning equipment for steel bridges and buildings. (10 pages with fig.)

**Report of Committee 17. — Wood preservation:** Service test records of treated wood; Review the specifications for creosote. (12 pages, tables & fig.)

**Report of Committee 3. — Ties:** Dimension of ties. (700 words.)

### Engineer. (London.)

1945 621 .131 (.42)
Engineer, May 11, p. 377.
HULME (H. J.). — **The trend of modern steam locomotive design.** (2 200 words.)

1945 621 .132 .1 (.44)
Engineer, May 18, p. 396.
**Future French locomotives.** (800 words & fig.)

1945 621 .132 .6 (.42)
Engineer, June 15, p. 469.
**L.N.E.R. tank engine.** (600 words & fig.)

1945 621 .132 .1 (.73)
Engineer, June 29, p. 500.
POULTNEY (E. C.). — **New York Central locomotives.** (2 800 words & fig.)

1945 656 .211 .7
Engineer, July 13, p. 34.
**Cross-channel transportation of rolling stock.** (1 800 words & fig.)

1945 621 .132 .1 (.42)
Engineer, July 20, p. 54.
**S.R. « West Country » Pacifics.** (400 words & fig.)

### Journal, Institution of Civil Engineers. (London.)

1948 691 (42)
Journal, Institution of Civil Engineers, January, p. 243
BILLIG (K.). — **Vacuum-concrete.** (16 pages, tables & fig.)

1948 51 & 62
Journal, Institution of Civil Engineers, February, p. 276.
INGLIS (C.). — **Mathematics in relation to engineering.** (14 pages.)

## The Locomotive. (London.)

**1948** 621 .431 .72 (42)
The Locomotive, February 14, p. 18.
**L.M.S. Diesel electric locomotive** No. 10000 (to be continued). (1 000 words & fig.)

---

**1948** 621 .132 .4 (.42)
The Locomotive, February 14, p. 19.
**L.N.E.R. 4-6-2 « A2 » locomotives.** (900 words & fig.)

---

**1948** 621 .335 (6)
The Locomotive, February 14, p. 29.
**New electric locomotives for South Africa.** (400 words.)

---

## Modern Transport. (London.)

**1947** 621 .132 .3 (.73) & 621 .132 .5 (.73)
Modern Transport, December 6, p. 11.
**New York Central system. 4-8-4 locomotives in service.** (600 words.)

---

**1947** 385 (09 (.492)
Modern Transport, December 6, p. 19.
**Impressions of Netherlands Railways.** (1 900 words & fig.)

---

**1947** 625 .4 (.42)
Modern Transport, December 13, p. 11.
**Further extension of L.P.T.B. Central line.** (600 words.)

---

**1947** 621 .431 .72 (.73)
Modern Transport, December 13, p. 21.
**L.M.S. motive power developments.** Britain's first main-line diesel-electric (400 words & fig.)

---

**1947** 621 .132 .3 (.42)
Modern Transport, December 20, p. 5.
RIDDLES (R. A.). — **Faster trains to Scotland.** Experiences of a locomotive engineer. (1 200 words.)

---

**1947** 621 .335 (.492)
Modern Transport, December 20, p. 10.
**Electric traction equipment for Netherlands Railways.** (300 words & fig.)

---

## Oil Engine and Gas Turbine (London.)

**1948** 621 .431 .72 (42)
Oil Engine and Gas Turbine, February, p. 334.
**Shunters** for permanent way depots. 29-ton machines ordered after trials. (1 000 words & fig.)

---

## Railway Age. (New York.)

**1948** 625 .28 (.73)
Railway Age, January 3, p. 162.
WOODWARD (E. L.). — **Trend to Diesel power continues.** (1 200 words & fig.)

---

**1948** 621 .3 (.73
Railway Age, January 3, p. 170.
OEHLER (A. G.). — **Electricity is causing maj changes.** (1 200 words & fig.)

---

**1948** 656 .254 (.73
Railway Age, January 3, p. 174.
PEACOCK (M.). — **Communications gain in impo tance.** (1 000 words & fig.)

---

**1948** 385 .1 (.73
Railway Age, January 3, p. 186.
PARMELEE (J. H.). — **A review of railway ope ations in 1947.** (3 200 words & tables.)

---

**1948** 625 .28 (.73
Railway Age, January 3, p. 209.
MILES (F. C.). — **Locomotives ordered in 1947.** (3 0 words & tables.)

---

**1948** 656 .212 (.73
Railway Age, January 10, p. 30.
**This modern yard expedites traffic.** (2 400 word tables & fig.)

---

## Railway Gazette. (London.)

**1947** 625 .1 (.42
Railway Gazette, No. 22, November 28, p. 616.
**The Ilford flyover L.N.E.R.** (600 words & fig.)

---

**1947** 385. (07 (.42
Railway Gazette, No. 22, November 28, p. 618.
**L.M.S.R. staff instructional filming.** (300 words & fig

---

**1947** 656 .215 (.42
Railway Gazette, No. 22, November 28, p. 621.
**Marshalling yard lighting experiment.** (500 words fig.).

---

**1947** 625 .242 (.6
Railway Gazette, No. 22, November 28, p. 622.
**Coal hopper wagon for Nigerian railway.** (400 wor & fig.)

---

**1947** 621 .43
Railway Gazette, No. 23, December 5, p. 643.
**Experimental 4000 H.P. gas turbine locomotive uni** A new Brown Boveri unit featuring a high-pressu stage of novel design. (500 words & fig.)

---

**1947** 621 .33 (.45
Railway Gazette, No. 23, December 5, p. 645.
PING (A. C.). — **Electrification of the Italian Sta Railways - 2.** (to be continued). (1 200 words & fig.)

---

**1947** 621 .335 (.42
Railway Gazette, No. 23, December, p. 648.
**All-motor trains for London Transport.** (600 wor & fig.)

---

**1947** 656 .283 (.42
Railway Gazette, No. 23, December 5, p. 654.
**Ministry of Transport Accident report.** — Stratfor L.P.T.B.: December 5, 1946. (1 000 words & fig.)

1947 625 .17 (.42)
ilway Gazette, No. 24, December 12, p. 673.
**Blanketing of track, Southern Railway.** (1 400 words, fig.)

1947 621 .33 (.42)
ilway Gazette, No. 25, December 19, p. 699.
**Central line extensions into Essex.** (1 800 words & fig.)

## Railway Mechanical Engineer. (New York.)

1947 625 .243 (73)
ilway Mechanical Engineer, December, p. 679.
Pullman-Standard develops **general-service box-car.** 200 words & fig.)

1947 621 .431 .72 (73) & 693 (.73)
ilway Mechanical Engineer, December, p. 683.
NOWDON (R. J.). — Eliminating **Diesel fire losses.** 000 words & fig.)

1947 621 .392 (73) & 625 .26 (73)
ilway Mechanical Engineer, December, p. 688.
GANNETT (H. E.). — **Welding in car repairs.** (2 400 rds.)

1947 621 .134 .1 (73)
ilway Mechanical Engineer, December, p. 710.
HALL (E. D.). — **Eliminating axle breakage.** (2 200 rds & fig.)

1947 656 .254 (73)
ilway Mechanical Engineer, December, p. 714.
MUSGROVE (E. H.). — **Power supply for cabooses.** 600 words & fig.)

1948 621 .134 .2 (.73) & 621 .134 .3 (.73)
ilway Mechanical Engineer, January, p. 73.
**A review of valve motion developments.** (1 500 words.)

1948 625 .251
ilway Mechanical Engineer, January, p. 77.
COON (R. C.). — **Locating causes of undesired road ergency applications.** (1 200 words.)

1948 621 .133 .3 (.73)
ilway Mechanical Engineer, January, p. 81.
TOWNSEND (A. J.). — **New developments in design locomotive boilers.** (1 800 words & fig.)

1948 621 .133 .3 (.73)
ilway Mechanical Engineer, February, p. 67.
WILLIAMS (A.). — **New developments in design of omotive boilers.** (2 000 words & fig.)

1948 621 .133 (01 (.73)
ilway Mechanical Engineer, February, p. 74.
MOSHER (F. D.). — **Locomotive boiler** performance. 800 words & fig.)

1948 625 .242 (73.)
ilway Mechanical Engineer, February, p. 90.
I.C. **builds five aluminium hopper cars.** (1 600 words fig.)

1948 621 .431 .72 (.73)
ilway Mechanical Engineer, February, p. 95.
JOHANSSON (A. V.). — **Diesel-electric speed-respon-e controls.** (1 200 words & fig.)

## In Danish. (= 439.81.)

### Ingeniøren. (Copenhagen.)

1948 625 .1 (.481) = 439 .81
Ingeniøren, No. 7, February, p. 118.
The **recent constructions of railways** in Norway. — Report of the speech of Mr. Kolsrud, Engineer in Chief, given at a meeting of the « Danish Society of Civil Engineers », by Mr. P. BENDTSEN. (4 100 words & fig.)

1948 625 .211 .7 (481 + 489) = 439 .81
Ingeniøren, No. 9, February, p. 145.
ENGQVIST (T.). — Must a ferry-boat service under State supervision link the railway systems and roads of the Northern parts of Jutland and Southern parts of Norway? (4 000 words & fig.)

## In Spanish.

### Ferroviarios. (Madrid.)

1947 625 .233 (.460)
Ferroviarios, octubre, p. 5.
Ensayo de **alumbrado fluorescente** en los coches de la RENFE. (1 100 palabras & fig.)

1947 625 .142 .4
Ferroviarios, octubre, p. 11.
ESCRIBA (N.). — La **traviesa de hormigon armado.** (700 palabras & fig.)

1947 656 .257 (.460)
Frroviarios, diciembre, p. 9.
CENDAN (C.). — **Mando y comprobacion centralizada a distancia.** (1 800 palabras & fig.)

### Revista de Obras Públicas. (Madrid.)

1948 625 .3 (.460)
Revista de Obras públicas, febrero, p. 56.
DE AGUINAGA (J.). — Reflexiones sugeridas por un viaje a Suiza. La red de **ferrocarriles de montaña** del Guadarrama es del mayor interés económico nacional, por lo que debe completarse inmediatemente. (1 700 palabras & fig.)

1948 624 .2
Revista de Obras públicas, febrero, p. 60.
MARIN TOYOS (J.). — Calculo rapido de las **vigas continuas.** (1 500 palabras & fig.)

## In Italian.

### Ingegneria ferroviaria. (Roma.)

1947 624 .6
Ingegneria ferroviaria, novembre, p. 535.
BELLUZZI (O.). — Sul calcolo numerico delle **linee d'influenza negli archi incastrati.** (1 000 parole, tabelle & fig.)

**1947** **656 .254 (.45)**
Ingegneria ferroviaria, novembre, p. 537.
Esperimento di **radiocomunicazioni ferrovarie.** (100 parole & fig.)

**1947** **625 .1 (.45) & 656 .211 (.45)**
Ingegneria ferroviaria, novembre, p. 539.
GOTELLI (R.). — La **sistemazione degli impianti ferroviari** di Genova. (6 000 parole, tavole & fig.)

**1947** **625 .28 & 656 .222 .1**
Ingegneria ferroviaria, novembre, p. 553; dic., p. 677.
TARTARINI (W.). — **Classificazione della capacità di marcia** di un convoglio. (9 000 parole & fig.)

**1947** **625 .244 (.45)**
Ingegneria ferroviaria, novembre, p. 561.
FASOLI (M.). — **Nuovi carri refrigeranti** delle F.S. (1 200 parole & fig.)

**1947** **656 .1 (.73) & 656 .2 (.73)**
Ingegneria ferroviaria, novembre, p. 584.
Un **automezzo circolante su binario e su strada.** (1 000 parole & fig.)

**1947** **656 .211 (.45)**
Ingegneria ferroviaria, dicembre, p. 623.
La **Stazione di Roma Termini.** Comunicazione della Direzione generale delle Ferrovie dello Stato. (17 000 parole, tavole & fig.)

## Trasporti pubblici. (Roma.)

**1947** **385. (06 .112 & 656**
Trasporti pubblici, agosto-settembre, p. 767.
MELLINI (E.). — **Dal Congresso di Lucerna al coordinamento internazionale dei trasporti.** (6 000 parole.)

**1947** **625 .62**
Trasporti pubblici, agosto-settembre, p. 777.
STAGNI (L.). — **Crisi economica delle aziende tranviarie urbane.** (3 000 parole & tabelle.)

**1947** **624 .2**
Trasporti pubblici, agosto-settembre, p. 813.
GOSSI (A.). — Le **sollecitazioni di torsione nella trave Vierendeel** incastrata rigidamente ad un estremo. (8 000 parole & fig.)

# In Dutch.

## Spoor- en Tramwegen. (Utrecht.)

**1947** **621 .133 .1 (.492)**
Spoor- en Tramwegen, nr 24, 20 November, p. 375; nr 25, 4 December, p. 396.
MOLENAAR (E. J.). — Nederlandse proefnemingen met **poederkool als locomotiefbrandstof.** (8 000 woorden & fig.)

**1947** **621**
Spoor- en Tramwegen, nr 24, 20 November, p. 382.
BRUIJN (H.). — **Kwikdampgelijkrichters** van « een-anodige type » en hun boogontsteking. (4
woorden & fig.)

**1947** **656 .222 .6 (.4**
Spoor- en Tramwegen, nr 25, 4 December, p. 392.
DEN HOLLANDER (F. Q.). — Het **spoorwegverv van Limburgse steenkolen.** (3 000 woorden & fig.)

**1947** **656 .1 (.4**
Spoor- en Tramwegen, nr 26, 18 December, p. 408.
REITSMA (S. A.). — Over het wetsontwerp tot **re ling van het goederenvervoer per vrachtauto** langs weg. (W.A.G.) (4 000 woorden.)

**1947** **656 .222 .5 (**
Spoor- en Tramwegen, nr 26, 18 December, p. 417.
POSTHUMUS MEYJES (P. Th.). — Parijs-Istanb Parijs per extra « **Simplon-Orient-Express** ». (2
woorden & fig.)

# In Portuguese.

## Gazeta dos Caminhos de ferro. (Lisboa.)

**1947** **656 .222 .5 (.460 + 4**
Gazeta dos Caminhos de ferro, nº 1439, 1 de dezemb
p. 499.
URIGÜEN (D. G.). — A **questão do « Sud-Expres** e as relaçoes ferroviárias internacionais de Portuga Espanha com a Europa. (1 600 palavras.)
ESTEVES (R.). — A **questão do « Sud-Expres** (2 500 palavras.)

**1948** **656 .211 (.46**
Gazeta dos Caminhos de ferro, nº 1441, 1 janeiro, p. 7.
DE ALMEIDA (J.). — **Lisboa e os problemas transporte.** (2 500 palavras & fig.)

**1948** **3**
Gazeta dos Caminhos de ferro, nº 1441, 1 janeiro, p. 11
MANITTO TORRES. — Do **«psicologico » em caminh de ferro.** (2 500 palavras.)

**1948** **624 (.46**
Gazeta dos Caminhos de ferro, nº 1441, 1 janeiro, p. 14
LOPES GALVAO (A.). — As **comunicações de Lisb** com o Sul do País. (5 000 palavras & fig.)

# In Swedish. (= 439.71)

## Teknisk Tidskrift. (Stockholm.)

**1948** **625 .42 (42 + 44) = 439 .**
Teknisk Tidskrift, No. 9, February, p. 113.
RIBBING (S.). — **Underground railways** in Lond and Paris. (10 000 words & fig.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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## I. — BOOKS.

### In French.

**948** 744
**.VALETTE.**
**ours complet de dessin industriel, 1re année.** — Con-
ne au programmes et aux normes officielles CNM.
aris, Dunod, éditeur. 50 planches et 4 pages de texte
.× 37), avec 450 figures. (Prix : broché, 240 fr.
çais.)

**948** 69 (02
**AMPLY (R.).**
**ormulaire pratique du bâtiment.**
aris, Girardot, éditeur, 27, quai des Grands-Augus-
. 1 volume (11 × 18 cm.) de 264 pages, avec 85 fi-
es. (Prix : 330 fr. français.)

**947** 621 .83
**CABREY (Ch.).**
**e formulaire des engrenages.** Traité pratique pour le
ul, le tracé et l'exécution des engrenages. 3e édition.
aris, Dunod, éditeur, 92, rue Bonaparte. 1 volume
× 22 cm.) de VIII-368 pages, avec 288 figures.
ix : broché, 750 fr. français.)

**948** 691
**GNEL (G.).**
**e béton précontraint.** Volume IV de la série : Pratique
calcul du béton armé.
and, Fecheyr, éditeur. 1 volume (16 × 24 cm.) de
pages, avec de nombreuses figures et photos ainsi que
sieurs tableaux. (Prix : 520 fr. belges.)

**947** 621 .438
**RCIER (E.).**
**é cycle équipression et la turbine à gaz.**
aris, Société d'encouragement pour l'Industrie natio-
. 1 brochure (21 × 27 cm.) de 36 pages avec figures.

**948** 62. (01
**IOSHENKO (S.).**
**ésistance des matériaux.** Tome I : **Théorie élémentaire**
**problèmes.** Traduit de l'anglais par Ch. LAFFITTE.
aris et Liége, Béranger, éditeur. 1 volume (16 × 24
) de 352 pages, avec 301 figures. (Prix : relié, 1 500 fr.
nçais.)

### In German.

**1947** 621 .331 (.494)
**EGGENBERGER (H.).**
**Unsere Kraftwerke.**
Zürich, Orell Füssli. 1 Band (20 × 13 Cm.), 80 Seiten
mit Abbildungen. (Preis : 3 Schweiz. Frank.)

**1947** 625 .214
**FÖPPL (L.).**
**Die strenge Lösung für die rollende Reibung.**
München, Leibniz Verlag. 43 Seiten. (Preis : bro-
schiert, R.M. 6.30.)

### In English.

**1947** 656 .25 (73)
**Association of American Railroads. — Signal Section.**
**Proceedings.** Minutes forty-ninth annual meeting, Chi-
cago, Ill., September 11, 12 and 13, 1947. (Bulletin
No. 2, Vol. XLIV.)
New York 7, N.Y. : Published by the Signal Section,
A.A.R.,30, Vesey Street.

**1948** 621 .438
**JUDGE (A. W.).**
**Modern gas turbines.**
London : Chapmann & Hall, Ltd., 37, Essex Street,
W.C. 2. (Price : 28s. net.)

**1948** 621 .132 .1 (42)
**Locomotive old and new : Some of the engines built by**
**the L.M.S. and its constituent Companies. 1829-1947.**
London : Obtainable from the London Midland Region
(Advertising & Publicity), Euston House, N.W. 1.
(9 × 7 inches) 63 pp. Fully illustrated. Paper covers.
(Price : 2s.6d.)

**1947** 385. (062 (73) & 625 .142 (73)
**Proceedings of the forty-third annual meeting of the**
**American Wood-Preservers Association. Vol. 43.**
1947. — Madison, Wisconsin : Democrat Printing Com-
pany. — A volume (6 1/4 × 9 inches) of 536 pages,
tables, figures and maps.

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress con-
tly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway
nce », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509)

1948 669 & 665 .882
**Symposium on metallurgy of steel welding.**
London: British Welding Research Association, 20, Park Crescent, W. 1. (Price: 10s.)

1947 531 .61
**World Power Conference. — Annual Report 1947.**
London: Prepared by the Central Office of the World Power Conference, 201-2, Grand Buildings, Trafalgar Square, W.C. 2. A brochure (7 7/8 × 9 3/4 inches) of 17 pages.

### In Italian.

1948
**SANTARELLA (L.).**
**Il cemento armato.** Monografie di costruzioni civi industriali italiane. III vol., VII edizione rifatta.
Milano, U. Hoepli, editore. 1 vol. in-8°, testo di pa XVI-428, con 333 figure; atlante di pagine VIII e 78 vole costruttive.

[ 016. 385. (05 ]

## II. — PERIODICALS.

### In French.

Bulletin de Documentation technique S.N.C.F. (Paris.)

1947 625. 214 (.73)
Bulletin de documentation technique — S.N.C.F., décembre. p. 359.
Les **dispositifs avertisseurs de boîtes chaudes** aux U.S.A. (1 000 mots & tableau.)

1948 621 .431 .72 (.73)
Bulletin de documentation technique — S.N.C.F., janvier, p. 3.
**Prévention et lutte contre l'incendie des locomotives Diesel** aux Etats-Unis. (1 800 mots.)

1948 621 .133 .1 (.42)
Bulletin de documentation technique — S.N.C.F., février, p. 31.
**Approvisionnement en mazout des locomotives** sur le « Great Western Railway » (Angleterre). (800 mots & fig.)

Bulletin de l'Union Internationale des Chemins de fer. (Paris.)

1947 385. (09 (.438)
Bulletin de l'Union intern. des ch. de fer, novembre-décembre, p. 433.
La **renaissance des Chemins de fer polonais.** (3 500 mots & tableaux.)

1948 385 .113 (4 + 5 + 6)
Bulletin de l'Union intern. des ch. de fer, janvier, p. 2, février, p. 52.
Les **chemins de fer en 1947** (Algérie, Allemagne, Autriche, Finlande, France, Grèce, Irak, Italie, Suisse, Syrie-Liban). (30 000 mots & tableaux.)

1948 656 .237
Bulletin de l'Union intern. des ch. de fer, janvier, p. 23.
**Facilités de crédit accordées aux usagers** par les Réseaux. (9 000 mots & tableaux.)

1948 625 .212 (
Bulletin de l'Union intern. des ch. de fer, janvier, p.
Les **rames sur pneumatiques** de la S.N.C.F. (3 mots.)

Bulletin de la Société des Ingénieurs civil de France. (Paris.)

1947 621 .133 .1 (.44) & 662 (
Bull. de la Soc. Ing. Civ. de France (mémoires), m avril, p. 198.
VERON. — **Conclusions et directives d'ensemble** rapports spécialisés de la **Commission des Economies Combustible).** (8 000 mots.)

1948 621 .
Bull. de la Soc. Ing. Civ. de France (mémoires), fa cule nos 2, 3 et 4, p. 31.
BRUN. — La **turbine à gaz** et les générateurs t miques à haut rendement. (2 800 mots.)

Génie Civil. (Paris.)

1948
Génie Civil, n° 3222, 1er février, p. 45.
Les **liants hydrocarbonés** et l'**étanchéité dans la** struction. (2 500 mots & fig.)

1948 625 .13 (
Génie Civil, n° 3223, 15 février, p. 61.
CALFAS (P.). — Les nouveaux **tunnels routiers** Queens-Midtown et de Brooklyn-Battery sous l'East ver, à New-York. (2 500 mots & fig.)

1948 62.
Génie Civil, n° 3224, 1er mars, p. 88.
BODET (P.). — Contribution à l'étude des **problè d'élasticité non linéaire.** (2 000 mots.)

1948 624 .7 (.4
Génie Civil, n° 3224, 1er mars, p. 90.
Le **pont Arpad** sur le Danube à Budapest. (1 500 m & fig.)

## Machines et Métaux. (Paris.)

47 669 .1
ines et Métaux, août, p. 266.
**traitement de l'acier** à basse température. (1 000
& fig.)

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47 621 .89
ines et Métaux, août, p. 274.
VE. — Mesure des couples de frottement en régime
**raissage** parfait. (5 000 mots & fig.)

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47 621 .82
ines et Métaux, septembre, p. 308.
s divers **types de roulements à billes et à rouleaux**
**ur graissage.** (3 000 mots & fig.)

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47 621 .89
ines et Métaux, septembre, p. 315; octobre, p. 345.
ARTINET (P.). — Vers une technique mécanique
**raissage.** (10 000 mots & fig.)

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47 62. (01
ines et Métaux, octobre, p. 333.
ARAT (A.). — La **photoélasticimétrie.** (5 000 mots
g.)

---

47 621 & 669
ines et Métaux, novembre, p. 361.
JGONNET (H.). — Directives pour l'**emploi des**
**ges légers** dans la mécanique. (7 000 mots & fig.)

---

947 621 .82
hines et Métaux, novembre, p. 371.
JTY (L.) & PICARD (F.). — Les **coussinets de**
**de bielle** dans les moteurs alternatifs. (2 000 mots
g.)

---

## Notre Métier. (Paris.)

947 621 .33 (.44)
re Métier. 21 janvier, p. 3; 11 février, p. 3.
**électrification** de l'artère maîtresse Paris-Lyon. (2 000
s & fig.)

---

947 385. (09 (.73)
re Métier, 25 février, p. 4; 11 mars, p. 3.
EGUE (J.). — Regards sur l'**activité ferroviaire** aux
.A. (4 000 mots & fig.)

---

947 385. (09 (.47)
re Métier. 15 avril, p. 4.
es **chemins de fer en U.R.S.S.** (1 200 mots & fig.)

---

## La Route du Rail. (Paris.)

947 625 .1 (.44 + .460)
Route du Rail, avril, p. 1; mai, p. 1.
ARTILLEUX (H.). — Les **Transpyrénéens.** (5 000
s, figures & cartes.)

**1947** **625 .42 (.44)**
La Route du Rail, avril, p. 9.
Le **réseau ferré du Chemin de fer Métropolitain** de
Paris. (3 000 mots & fig.)

---

**1947** **621 .132 .7 (.44) & 621 .431 .72 (.44)**
La Route du Rail, avril, p. 18.
Les **nouvelles locomotives de manœuvre Diesel-électriques** S.N.C.F. (800 mots & fig.)

---

## Revue de l'Association française des Amis des Chemins de fer. (Paris.)

**1947** **656 .211 (.44) & 656 .212 (.44)**
Revue de l'Ass. fr. des amis des Ch. de fer, nº 146,
septembre-octobre, p. 97.
CAMUS. — L'évolution dans la technique de l'**établissement et de l'exploitation des grandes gares** de la
S.N.C.F. (10 000 mots & fig.)

---

**1947** **621 .131 .3 (.42)**
Revue de l'Ass. fr. des amis des Ch. de fer, nº 146,
septembre-octobre, p. 110.
Le **banc d'essais mobile** (L.M.S.Ry.). (1 000 mots &
fig.)

---

**1947** **621 .431 .72 (.44)**
Revue de l'Ass. fr. des amis des Ch. de fer, nº 146,
septembre-octobre, p. 111.
TOURNEUR. — La **traction Diesel** à la S.N.C.F.
(2 400 mots & fig.)

---

## Revue générale des chemins de fer. (Paris.)

**1948** **621 .33**
Revue générale des chemins de fer, février, p. 37.
**La traction électrique par courant monophasé à 50 périodes.**
PROT (M.). — I. **Considérations générales.**
ARMAND. — II. **Problèmes techniques posés par la traction monophasée à 50 p./s. et leurs solutions.** (6 000
mots & fig.)

---

**1948** **621 .331 (.44)**
Revue générale des chemins de fer, février, p. 45.
GARREAU (M.). — Les **sous-stations** de traction à
courant continu 1 500 V. Leur évolution technique.
(12 000 mots & fig.)

---

**1948** **62. (01 & 625 .212**
Revue générale des chemins de fer, février, p. 60.
KAMMERER. — Le **calcul des pièces soumises à des forces périodiques** (4 000 mots.)

---

**1948** **621 .335 (.44)**
Revue générale des chemins de fer, février, p. 64.
Les **futurs éléments automoteurs de banlieue** de la Région du Sud-Est. (1 000 mots & fig.)

## In German.

### Signal und Draht. (Frankfurt a./Mein.)

**1948** **656 .25**
Signal und Draht, Nr. 1, S. 3.
DOBMAIER (A.). — **Rückblick und Ausblick im Signal- und Fernmeldewesen.** (5 000 Wörter.)

**1948** **656 .254**
Signal und Draht, Nr. 1, S. 7; Nr. 2, S. 19.
REINHARD (K.). — Aufsuchen von **Störungen in Grossnetzverbindungen.** (6 000 Wörter, Tafeln & Abb.)

**1948** **656 .253**
Signal und Draht, Nr. 1, S. 9.
CHAUSSETTE (G.). — Die Ausbilding der **Signal-anlagen auf Bahnhöfen eingleisiger Strecken.** (3 000 Wörter.)

**1948** **537 .7 & 656 .25**
Signal und Draht, Nr. 2, S. 13.
BUCKEL (R.). — Elektrische Messgeräte und Messverfahren für den **Unterhaltungsdienst im Signal- und Fernmeldewesen.** (3 000 Wörter & Abb.).

**1948** **656 .257**
Signal und Draht, Nr. 2, S. 16.
NITSCHKE (W.). — Letzte Änderung der Vorschriften für den **Block- und Stellwerkdienst.** (2 800 Wörter & Tafel.)

## In English.

### British Railways, Western Region Magazine. (London.)

**1948** **656 .254**
British Railways. Western Region Magazine, February, p. 27.
Signalling progress. — Improved **block telegraph instrument** designed on the Western. (600 words & fig.)

### Bulletin, American Railway Engineering Association. (Chicago.)

**1948** **624 .2**
Bulletin, American Railway Engineering Association, Vol. 49, No. 471, January, p. 279.
REPORT OF COMMITTEE 30. — **Impact and bridge stresses:** Distribution of live load in transverse floors and longitudinal stringers. (1 500 words, tables & fig.)

### Engineer. (London.)

**1945** **621 .133 .3 (.73)**
Engineer, Aug. 10, p. 107.
TRATMAN RUSSEL (E.E.). — **Accidents to locomotives on American railways.** (2 200 words & tables.)

**1945** **621 .132 .1 (.**
Engineer, Aug. 17, p. 122; Aug. 24, p. 144.
NOCK (O.S.). — **British locomotive working in** **time.** (6 400 words & fig.)

### Engineering (London.)

**1947** **621 .335 (.**
Engineering, No. 4273, Dec. 19, p. 597.
COCK (C.M.). — **Electric traction on the South** **Railway.** (6 800 words & fig.)

**1948** **625 .**
Engineering, No. 4275, Jan. 2, p. 21; No. 4276, Jan p. 45.
PARKER (R.C.) & MARSHALL (P.R.). — Measurement of the temperature of **railway brake blocks.** (5 words & fig.)

**1948** **621 .431 .72 (**
Engineering, No. 4277, Jan. 16, p. 54.
BERGER (L.B.), ELLIOTT (M.A.), HOLTZ (J. & SHRENK (H.H.). — **Diesel engines underground.** be continued.) (1 800 words & fig.)

**1948** **385 (071 .3 (**
Engineering, No. 4279, Jan. 30, p. 102.
**Apprentice training school;** Derby locomotive wo (1 200 words & fig.)

**1948** **621 .431 & (**
Engineering, No. 4280, Febr. 6, p. 139.
WILLIAMS (C.D.B.). — Porous-chromium **harden of Diesel engine cylinders.** (1 200 words.)

### The Locomotive. (London.)

**1948** **621 .135 .2 (**
The Locomotive, No. 667, March 15, p. 33.
**London Midland Region loco. experiments.** (800 wo & fig.)

**1948** **621 .132 .3 (42) & 621 .132 .4 (**
The Locomotive, No. 667, March 15, p. 34.
**London Midland Region 2-6-0 locomotives.** (700 wo & figs.)

**1948** **621 .431 .72 (**
The Locomotive, No. 667, March 15, p. 36.
**L.M.S. Diesel-electric loco. No. 10000** (conclude (600 words & fig.)

**1948** **621 .132 .3**
The Locomotive, No. 667, March 15, p. 38.
**2-8-2 locomotives for Tanganyika.** (800 words & fi

**1948** **621 .431 .72 (**
The Locomotive, No. 667, March 15, p. 39.
**« Brush » Diesel-electric locomotive.** (900 words fig.)

## Modern Transport. (London.)

947 625 .4 (.42)
lern Transport, Dec. 20, p. 15.
**pening the Eastern Avenue tube.** (600 words & fig.)

---

947 385 (09 (.42)
lern Transport, Dec. 20, p. 3.
**ritish Railways.** — Achievements under private enter-e. (1 800 words.)

---

947/48 625 .28 (.42)
lern Transport, Dec. 27, p. 12; January 3, p. 12; February 7, p. 3; February 14, p. 11.
**inal L.M.S. motive power developments.** — Arrange-its for **comparison of steam Pacific** with **Diesel-elec-** performance. (5 600 words & fig.)

---

947/48 625 .23 (.42)
lern Transport, Dec. 27, p. 15; January 3, p. 13.
**ritish railway carriages.** — 44-45-stock for Irish rail-ys. (To be continued.) (2 400 words & fig.)

---

948 621 .135 .1 (42)
dern Transport. January 3, p. 11.
**ocomotive frames.** Causes of cracking. L.M.S. in-tigation. (600 words.)

---

948 621 .132 .3 (42) & 621 .132 .5 (42)
dern Transport, January 3, p. 14.
'inal L.N.E.R. **Pacific locomotive.** (1 200 words & )

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948 656 .212 .6 (42)
dern Transport, January 3, p. 15.
**12-ton mobile crane.** (600 words & fig.)

---

1948 621 .431 .72 (42)
dern Transport. January 10, p. 5.
'he **Brush Diesel-electric shunter.** (1 200 words & )

---

1948 625 .232 (42)
dern Transport, January 10, p. 13.
**mproved sleeping cars.** Novel L.N.E.R. design for rd class. (1 200 words & fig.)

---

1948 621 .131 .1 (42)
dern Transport, January 10, p. 17.
**ocomotive sand supply.** New L.N.E.R. system. (300 rds & fig.)

---

1948 625 .245 (42)
dern Transport. January 10, p. 17.
**Rail conveyance of paint.** (200 words & fig.)

---

## he Oil Engine and Gas Turbine. (London.)

1948 621 .431 .72 (42)
e Oil Engine and Gas Turbine, No. 179, March, p. 368.
**Transmission units for rail vehicles.** (800 words & .)

## Railway Age. (New York.)

1948 624 .1 (.73)
Railway Age, January 17, p. 32.
DISNEY (C.P.). — **Something new in bridge-pier design.** (2 200 words & fig.)

---

1948 625 .24 (.73)
Railway Age, January 17, p. 41.
SUCKFIELD (G.A.). — **How the hopper car has developed.** (1 800 words & fig.)

---

1948 621 .431 .72 (.73)
Railway Age, January 24, p. 30.
**Road Diesel is found economical in short-run service.** (1 200 words, tables & diagram.)

---

1948 656 .212 (.73)
Railway Age, January 24, p. 35.
RICE (W.T.). — **Neglected yard maintenance is costly.** (1 300 words & fig.)

---

1948 621 .133 .1 (.73)
Railway Age, January 24, p. 40.
PAYNE (E.C.). — **Regional standards for locomotive fuel.** (2 200 words & fig.)

---

1948 656 .212 .8 (.73)
Railway Age, January 31, p. 38.
**Builds car-a-minute dumper at Lorain.** (2 600 words & fig.)

---

1948 621 .132 .8 (.73) & 621 .438 (.73)
Railway Age, January 31, p. 46.
YELLOTT (J.I.), BROADLEY (P.R.) & KOTTCAMP (C.F.). — **Coal-burning gas-turbine locomotive.** (1 800 words & diagram.)

---

## Railway Engineering and Maintenance. (Chicago.)

1948 625 .144 .4 (73) & 625 .173 (73)
Railway Engineering and Maintenance, February, p. 150.
**Ties renewed on large bridge** in minimum time. (1 800 words & fig.)

---

1948 625 .173 (73)
Railway Engineering and Maintenance, February, p. 155.
UNZICKER (E.M.). — **Renewing the trackwork** at a congested interlocking. (1 600 words & fig.)

---

1948 625 .173 (73)
Railway Engineering and Maintenance, March, p. 278.
KERSHAW (R.). — **Railroad contractor cuts costs with modern methods and machines.** (2 800 words, tables & fig.)

---

## Railway Gazette. (London.)

1947 625 .214 (.73)
Railway Gazette, No. 25, Dec. 19, p. 703.
**Increasing use of roller bearings in U.S.A.** (600 words & fig.)

**1947** 621 .132 .8
Railway Gazette, No. 26, Dec. 26, p. 726.
The **further development of the Franco locomotive.** (1 800 words & fig.)

**1947** **624 .51 (.42)**
Railway Gazette, No. 26, Dec. 26, p. 729.
**Repairs to Strangford Viaduct, G.W.R.** (800 words & fig.)

**1948** **621 .431 .72 (42)**
Railway Gazette, No. 1, Jan. 2, p. 16.
Main-line **Diesel-electric locomotive** for the London Midland Region. (1 800 words & fig.)

**1948** **621 .132 .3 (42)**
Railway Gazette, No. 1, Jan. 2, p. 20.
L.M.S.R. **4-6-2 « Coronation » type locomotive** « Sir William A. Stanier, F.R.S. ». (600 words & fig.)

**1948** **656 .23 (42)**
Railway Gazette, No. 2, Jan. 9, p. 37.
Nationalisation. — **Zonal C. & D. adapted for co-ordination.** (1 000 words.)

**1948** **621 .132 .5 (42)**
Railway Gazette, No. 2, Jan. 9, p. 48
New Doncaster-built **Pacific locomotive.** (400 words & fig.)

**1948** **625 .242 (42)**
Railway Gazette, No. 3, Jan. 16, p. 77.
**All-steel waggons,** North Eastern Region. (2 600 words & fig.)

**1948** **625 .234 (42)**
Railway Gazette, No. 4, Jan. 23, p. 103.
**Air circulation fans for tube stock.** (400 words & fig.)

**1948** **621 .132 .6 (42)**
Railway Gazette, No. 4, Jan. 23, p. 105.
**L.M.S.R. 2-6-2 tank engines** for secondary services. (600 words & fig.)

**1948** **656 .212 .4 (73)**
Railway Gazette, No. 4, Jan. 23, p. 106.
Union Pacific **hump yard** at Pocatello. (300 words & fig.)

**1948** **624 .5 (54)**
Railway Gazette, No. 4, Jan. 23, p. 108.
A new **Indian railway bridge.** (1 200 words & fig.)

## In Spanish.

### Ferrocarriles y Tranvias. (Madrid.)

**1947** **621 .335 : 625 .42 (.460)**
Ferrocarriles y Tranvias, octubre, p. 383.
QUINONERO LUNA (E.). — **Nuevos automotores** del ramal Opera-Norte del Metropolitano de Madrid. (8 000 palabras & fig.)

**1947** **656 .222 .4 (.4**
Ferrocarriles y Tranvias, octubre, p. 400.
RUIZ del CAMPO (F.). — Un **procedimiento para** **cular el servicio integral** de una linea ferroviaria. (1 palabras, cuadro & fig.)

**1947**
Ferrocarriles y Tranvias, noviembre, p. 429.
CATENA (R.). — **Geologia en los ferrocarriles.** (2 palabras & fig.)

**1947** **625 .1**
Ferrocarriles y Tranvias, noviembre, p. 438.
TOBALINA (E.). — **Las traviesas** en los ferrocarri (1 500 palabras & fig.)

**1947** **347 .7**
Ferrocarriles y Tranvias, noviembre, p. 440.
SANCHEZ GAMBORINO (F. M.). — La prescripc de acciones derivadas del **contrato de transporte:** cau que la interrumpen. (2 500 palabras.)

**1947** **625 .1**
Ferrocarriles y Tranvias noviembre, p. 443.
CHARLET (A. L.). — La **regularización de las cur de ferrocarriles** por el método del diagrama de las ir gularides de L. Boudin. (8 000 palabras & fig.)

## In Italian.

### Annali dei Lavori pubblici. (Roma.)

**1940** **624 .61 (.4**
Annali dei Lavori pubblici, marzo, p. 185.
DE SIMONE (D.). — **Crollo e ricostruzione del po** della Vittoria a Pisa. (11 000 parole & fig.)

**1941** **624**
Annali dei Lavori pubblici, febbraio, p. 113.
BENINI (A.). — Sollecitazioni di torsione, flession taglio nella **trave ad arco circolare.** (3 500 parole, tav & fig.)

**1941** **721**
Annali dei Lavori pubblici, maggio, p. 352.
MORANDI (R.). — Contributo alla determinazione un criterio di calcolo per **strutture di fondazione** pc immediatamente al disopra di una palificata. (4 000 role & fig.)

**1941** **624**
Annali dei Lavori pubblici, aprile, p. 267.
FANELLI (E.). — **Sistemi elastici nelle costruzi civili.** (5 000 parole & fig.)

**1941** **625 .13 (.4**
Annali dei Lavori pubblici, luglio, p. 522.
TOCCHETTI (L.). — **L'abbassamento in galleria a ficiale della ferrovia** Napoli-Torregaveta tra le stazioni Fuorigrotta e Campi Flegrei. (5 000 parole & fig.)

942 624

ali dei Lavori pubblici, settembre, p. 539.

UIDI (C.C.). — Sull'impiego delle cerniere in nbo nella **costruzione dei ponti.** (2 500 parole & fig.)

942 691

ali dei Lavori pubblici, ottobre-novembre-dicembre, p. 583.

UIDI (C.C.). — Contributo al calcolo del **cemento ato precompresso.** (12 000 parole & fig.)

## Ingegneria ferroviaria. (Roma.)

948 621 .133 .5

egneria ferroviaria, gennaio, p. 3.

e GREGORIO (C.). — Sugli **inconvenienti dello scap= nento naturale** nelle locomotive a vapore. (5 000 parole ig.)

948 656 (.45)

egneria ferroviaria, gennaio, p. 11.

IATERNINI (M.). — Criteri d'orientamento per un ionale **coordinamento dei trasporti.** (6 000 parole.)

1948 624 .2

egneria ferroviaria, gennaio, p. 17.

POZZATI (P.). — Sull' **instabilità della trave Vieren= l.** (3 000 parole & fig.)

1948 625 .62

egneria ferroviaria, gennaio, p. 21.

BENOFFI (U.). — **Organizzazione degli approvvigio= nenti** nel servizio impianti fissi d'un esercizio tran- rio. (2 000 parole & fig.)

1948 624 .1

egneria ferroviaria, gennaio, p. 27.

BELTRAMI (V.). — **Riparazione di fondazioni di un nte** con cassoncino mobile. (1 000 parole & fig.)

# In Dutch.

## Spoor- en Tramwegen. (Utrecht.)

**1948** **385 .57**

Spoor- en Tramwegen, nr 1, 1 Januari, p. 3.

BUIJS (Drs. S.). — **Bedrijfskadertraining.** (2 500 woorden.)

**1948** **385. (09 (.492)**

Spoor- en Tramwegen, nr 1, 1 Januari, p. 12.

De **Nederlandsche Spoorwegen in 1947.** Een terugblik. (1 000 woorden.)

**1948** **385 (09 .3 (.492)**

Spoor- en Tramwegen, nr 3, 29 Januari, p. 33; nr 5, 26 Februari, p. 75; nr 6, 11 Maart, p. 85; nr 7, 25 Maart, p. 101.

REITSMA (S. A.). — Hoe de **eerste spoorwegverbin= ding van de twee Nederlandse havensteden naar Keulen** tot stand kwam. (13 000 woorden & fig.)

**1948** **385 .517 .6 (.44)**

Spoor- en Tramwegen, nr 3, 29 Januari, p. 36.

de PEYRET (F.). — **Medisch onderzoek** bij de Franse Spoorwegen. (1 300 woorden & fig.)

**1948** **625 .164 (.48)**

Spoor- en Tramwegen, nr 3, 29 Januari, p. 38; nr 4, 12 Februari, p. 55.

VAN DORSSER KEUS (J. A.). — De **strijd tegen sneeuw en ijs** in noordelijke landen. (13 000 woorden & fig.)

**1948** **621 .332 (.492)**

Spoor- en Tramwegen, nr 4, 12 Februari, p. 60.

VAN der HOEK (E.). — **Nieuwe leidingonderbrekers** bij de N.S. De ontwikkeling van eenige nieuwe typen gedurende de jaren 1941-1947. (1 600 woorden & fig.)

**1948** **656**

Spoor- en Tramwegen, nr 5, 26 Februari, p. 65.

REITSMA (S. A.). — Een belangrijk proefschrift over **verkeerswezen.** (6 000 woorden.)

**1948** **385. (09 (.8)**

Spoor- en Tramwegen, nr 5, 26 Februari, p. 69.

**Toekomstplannen** van de Zuid-Amerikaanse Spoorwe- gen. (4 500 woorden & fig.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

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## I. — BOOKS.

### In French.

**948** **669**
**AUSSIN (C.) et HILLY (G.).**
**allurgie.** Tome I: **Alliages métalliques.**
aris, Dunod, éditeur. 1 volume (16×25 cm.) de XIV- pages, avec 153 figures. (Prix: 380 fr. français.)

**948** **621. 83**
**RGERE (J.).**
**ésistance et encombrement des engrenages.** Résistance encombrement des engrenages cylindriques droits. Ré- ance et encombrement d'engrenages autres que les en- nages cylindriques à denture droite.
'aris, Dunod, éditeur, 92, rue Bonaparte. 2 volumes, pages (27×21) avec figures et deux dépliants. (Prix 2 volumes brochés: 1 250 fr. français.)

**1948** **624**
**MARET (J.).**
**Esthétique et construction des ouvrages d'art.**
'aris, Dunod, éditeur. 1 volume (18× 24 cm.) de VIII-192 pages, avec 279 figures. (Prix: 1 180 fr. nçais.)

**1948** **62. (01 & 691**
**DUART (A.).**
**Résistance du béton armé à l'effort tranchant.**
'aris. Dunod, et Liège, Desoer, éditeurs. 1 volume ×24 cm.) de 160 pages, avec 119 figures et 14 aba- es. (Prix: 540 fr. français.)

**1947** **721 .1**
**ERDEYEN (J.).**
**Mécanique du sol et fondations.**
Liège, S. A. Desoer, éditeur. 1 volume (16×24 cm.) 564 pages et 320 figures. (Prix: 475 fr. belges.)

### In English.

**1948** **385 (02 (42)**
**British Transport Directory of Officials.**
London: Reprinted from « The Railway Gazette », 33, Tothill Street, Westminster, S.W. 1. One brochure (5 1/8 × 8 1/4 inches) of 40 pages. Paper covers. (Price: 1s.)

**1948** **669**
**JONES (E.J.H.).**
**Production engineering. Jig and tool design.** Fifth edition.
London: George Newnes Ltd., Tower House, South- ampton Street, Strand, W.C. 2. (Price: 17s6d net.)

**1948** **385 (03 (73)**
**Locomotive Cyclopedia of American practice.** Thir- teenth edition.
New York, Simmons-Boardman Publishing Corpora- tion, 30, Church Street, N.Y. 7. (Price: $ 8.00.)

**1948** **621 .1**
**LYLE (O.).**
**The Efficient use of steam.**
London, His Majesty's Stationery Office, Kingsway, W.C. 2. (Price: 15s.)

**1948** **625 (42)**
**NOCK (O.S.).**
**The railways of Britain: Past and Present.**
London, B.T. Batsford Ltd., 15, North Audley-street, Mayfair, W. 1. (Price: 15s.)

**1947** **625**
**RAYMOND (W.G.), RIGGS (H.E.) and SADLER (W.C.).**
**Elements of railroad engineering.** Sixth edition.
New York, John Wiley & Sons; London, Chapman & Hall. Cloth (5 3/4×9 in.) 442 pp., illustrated, diagrams, charts, tables. (Price: $ 5.)

**1948** **62 (07**
**THOMPSON (James-E.).**
**Engineering Organisation and Methods.**
London, McGraw Hill Publishing Company Ltd., Ald- wych House, Aldwych, W.C. 2. (Price: 24s.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress con- ntly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway ence », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

[ 016. 385. (05 ]

## II. — PERIODICALS.

### In French.

#### Bulletin de l'Union Internationale des Chemins de fer. (Paris.)

**1948** **385 .1 (.73)**
Bulletin de l'Union intern. des ch. de fer, février, p. 65.
PARMELEE (J.-H.). — **Evolution des chemins de fer aux Etats-Unis en 1947.** (1 500 mots & tableaux.)

**1948** **623 (.489)**
Bulletin de l'Union intern. des ch. de fer, février, p. 74.
ENGQVIST (Th.). — La **résistance et les sabotages** sur les Chemins de fer danois. (3 000 mots & carte.)

#### Bulletin technique de la Suisse romande. (Lausanne.)

**1948** **656 .211 (.494) & 725 .31 (.494)**
Bulletin technique de la Suisse romande, 24 avril, p. 109.
TSCHUMI (J.). — Le **problème de la nouvelle gare de Berne.** (3 000 mots & fig.)

**1948** **669**
Bulletin technique de la Suisse romande, 8 mai, p. 132.
DUMAS (A.). — La **fatigue des métaux.** (1 000 mots & fig.)

#### Bulletin des C. F. F. (Berne.)

**1948** **659**
Bulletin des C.F.F., février, p. 23.
SCHENKER (E.). — Les chemins de fer étrangers et le **film.** (2 500 mots.)

**1948** **621 .138 .3 (.494)**
Bulletin des C.F.F., février, p. 26.
SCHORI (A.). — **Intéressante réparation d'une locomotive à vapeur** (fissure de cylindre). (1 000 mots & fig.)

**1948** **656 .234 (.494)**
Bulletin des C.F.F., mars, p. 38.
FISCHER (W.). — Les **nouveaux tarifs de voyageurs.** (2 500 mots & tableaux.)

#### Bulletin des Transports internationaux par chemins de fer. (Berne.)

**1948** **385 .63 & 656 .223 .2**
Bulletin des transports internationaux par chemins de fer, février, p. 47; mars, p. 85.
de la MASSUE (H.). — Les faiblesses et la réforme du **règlement international concernant le transport des wagons de particuliers « R.I.P. ».** (12 000 mots.)

**1948** **385 .4 (.481**
Bulletin des transports internationaux par chemins d
fer, février, p. 70.
Le **statut administratif** des Chemins de fer de l'Eta
norvégien. (1 500 mots.)

**1948** **313 : 385 (.489**
Bulletin des transports internationaux par chemins d
fer, février, p. 76.
Les **Chemins de fer de l'Etat danois** pendant l'exercic
1946/47. (Tableau.)

#### Génie Civil. (Paris.)

**1948** **624 .52 (.54**
Génie Civil, n° 3225, 15 mars, p. 101.
Le nouveau **pont cantilever** sur le Gange, à Calcutta
(2 500 mots & fig.)

**1948** **656 .25**
Génie Civil, n° 3225, 15 mars, p. 103.
L'exposition de la **radioélectricité et de ses application ferroviaires.** (Paris, 15 déc. 1947 — 4 janvier 1948.
(3 000 mots & fig.)

**1948** **62. (0**
Génie Civil, n° 3225, 15 mars, p. 106.
MASSE (R.). — Méthode de calcul pratique des con**structions à angles rigides.** (1 200 mots & fig.)

**1948** **385 .5**
Génie Civil, n° 3226, 1er avril, p. 126.
GOMBERT (G.). — Choix d'une méthode de **qualif cation du travail.** (3 000 mots.)

#### L'Industrie des voies ferrées et des transports automobiles. (Paris.)

**1947** **621 .332 (.494**
L'Industrie des Voies ferr. et Transp. automob., noven
bre, p. 171.
ALBERT (L.). — Caractéristiques générales des **ligne de contact** équipant de nombreux réseaux suisses. Mo
tage Kummler et Matter. (4 000 mots, tableaux & fig.

**1947** **621 .431 .7**
L'Industrie des Voies ferr. et Transp. automob., noven
bre, p. 180.
PRUNY. — La **transmission électrique** avec régulatio
à moteur pilote. (6 000 mots & fig.)

#### L'Ossature métallique. (Bruxelles.)

**1947** **621 .332 (.493**
L'Ossature métallique, décembre, p. 513.
DE SAEGHER et VERDEYEN (J.). — **Pylônes e croix pour supports de caténaires.** (3 600 mots & fig.)

**1947** **624 .2**

L'Ossature métallique, décembre, p. 524.
MASSONNET (Ch.). — Applications de la **théorie du flambage** des barres à parois minces à quelques types particuliers de sections droites. (4 000 mots & fig.).

---

## Revue de l'Association française des Amis des Chemins de fer. (Paris.)

**1948** **621 .132 .8**

Revue de l'Ass. fr. des amis des ch. de fer, n° 148, p. 1.
ROBINET (B.). — Les **locomotives à turbines à vapeur.** (20 000 mots, tableaux & fig.)

---

## Revue générale des chemins de fer. (Paris.)

**1948** **656 .1 (.44)**

Revue générale des chemins de fer, mars, p. 73.
DELACARTE et POUZADOUX. — **Desserte routière** des petites gares de l'artère Paris-Lyon. (3 500 mots & fig.)

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**1948** **624 .8 (.44)**

Revue générale des chemins de fer, mars, p. 79.
CARPENTIER et TERRAS. — La **reconstruction provisoire du viaduc** de Caronte. (6 000 mots & fig.)

---

**1948.** **625 .143 .5 (.44)**

Revue générale des chemins de fer, mars, p. 92.
SONNEVILLE et BENTOT. — Essais de **nouvelles semelles élastiques** dans les voies de la S.N.C.F. (7 000 mots & fig.)

---

## Revue universelle des Mines. (Liége.)

**1946** **624 .62 (.493)**

Revue universelle des mines, n° 4, p. 166.
LEMAIRE (C.). — La **démolition et la reconstruction du pont du « Val Benoît »**, à Liège. (5 000 mots et fig.)

---

**1946** **621 .33**

Revue universelle des mines, n° 9, p. 395.
MUSYCK (J.). — La **traction électrique sur les grandes lignes de chemins de fer.** (7 000 mots & fig.)

---

**1947** **62. (01 (.494)**

Revue universelle des mines, n° 3, p. 85.
Dr. ROS (M.). — Signification, résultats et perspectives de **l'essai des matériaux selon l'expérience suisse.** (4 000 mots & fig.)

---

**1947** **62. (01**

Revue universelle des mines, n° 4, p. 118.
MASSONNET (Ch.). — Développements récents et perspectives d'avenir en **résistance des matériaux.** (9 000 mots & fig.)

---

**1947** **625 .123**

Revue universelle des mines, n° 4, p. 129.
IRMAY (S.). — Sur le **mouvement des eaux dans le sol.** (9 000 mots & fig.)

**1947** **621 .82**

Revue universelle des mines, n° 7, p. 245.
HANOCQ (Ch.). — Recherches sur la loi de dissipation de la chaleur dans les **paliers refroidis** par convection naturelle. (8 000 mots, tableaux & fig.)

---

**1948** **621 .83**

Revue universelle des mines, n° 2, février, p. 196.
WOLPER. — Le contrôle des **engrenages.** (5 000 mots & fig.)

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# In German.

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## Glasers Annalen. (Berlin.)

**1948** **621 .131 .1**

Glasers Annalen, Heft 1., Januar, S. 1.
WOLFF (A.). — **Bewertung des Lokomotivparks** grosser Eisenbahn-Verwaltungen. (9 000 Wörter, Tafeln & Abb.)

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**1948** **621 .133 .2**

Glasers Annalen, Heft 1., Januar, S. 10.
Dr. METZELTIN. — Das **Brechen der Stehbolzen.** (2 700 Wörter.)

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**1948** **621 .335**

Glasers Annalen, Heft 1., Januar, S. 13.
**Oerlikon-Gyrofahrzeuge.** (3 500 Wörter & Abb.)

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**1948** **621 .431 .72 (.44)**

Glasers Annalen, Heft 2., Februar, S. 22.
BORN (E.). — Die **Einheits-Dieselfahrzeuge** der Französischen Nationalbahnen. (2 500 Wörter & Tafel.)

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**1948** **621 .133 .1**

Glasers Annalen, Heft 2., Februar, S. 24.
Dr. METZELTIN. — **Braunkohlenfeuerung für Lokomotiven.** (1 800 Wörter.)

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**1948** **625 .212**

Glasers Annalen, Heft 2., Februar, S. 26.
**Hohlachsen für Eisenbahnwagen.** (1 100 Wörter.)

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# In English.

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## Bulletin, American Railway Engineering Association. (Chicago.)

**1948** **625 .14 (01 (73)**

Bulletin, American Railway Engineering Association, No. 472, February, p. 328.
**Report of Committee 5. — Track.**
MAGEE (G.M.). — **A study of guarding of the center frog in small angle crossings.** (1 800 words & fig.).

---

**1948** **625 .154 (73)**

Bulletin, American Railway Engineering Association, No. 472, February, p. 334.
**Report of Committee 5. — Track.**
Progress report on performance of **solid manganese crossing frogs and special frog support.** (400 words & fig.)

**1948** **625 .142 (0 (73)**
Bulletin, American Railway Engineering Association, No. 472, February, p. 337.
**Report of Committee 5. — Track.**
**Design and stresses in tie plates.** (2 000 words & fig.)

**1948** **625 .143 .5 (.73)**
Bulletin, American Railway Engineering Association, No. 472, February, p. 357.
**Report of Committee 5. — Track.**
**Hold-down fastenings for tie plates**; design, use and economy with respect to minimizing tie wear. (3 600 words & fig.)

## The Engineer. (London.)

**1947** **621 .431 .72 (42)**
The Engineer, Dec. 26, p. 596.
L.M.S. main line **Diesel-electric locomotive.** (2 800 words & fig.)

**1947** **621 .431 .72 (42)**
The Engineer, Dec. 26, p. 607.
A **Diesel-electric shunting locomotive.** (1 200 words & fig.)

**1948** **385 (09**
The Engineer, Jan. 2, p. 9.
JOHNSON (N.). — **Nationalisation of railways** (to be continued). (2 000 words.)

**1948** **625 .28 (42)**
The Engineer, Jan. 9, p. 50; Jan. 16, p. 65.
**Some locomotives of 1947** (5 400 words & fig.)

**1948** **621 .132**
The Engineer, Jan. 30, p. 112.
SIMPSON (C.R.H.). — **The future of steam locomotives.** (900 words.)

## Journal and Proceedings, Institution of Mechanical Engineers. (London.)

**1947** **625 .28 (42)**
Proceedings, Institution of Mechanical Engineers, 1947, Vol. 157, War Emergency issue No. 30, p. 235.
BULLEID (O.V.S.), HAWKSWORTH (F.W.), IVATT (H.G.) and PEPPERCORN (A.H.). — **Railway power plant** in Great Britain. (3 000 words & fig.)

**1947** **625 .28 (42)**
Proceedings, Institution of Mechanical Engineers, 1947, Vol. 157, War Emergency issue No. 30, p. 239.
ARMAND (L.). — **Motive power trends** on European railways. (2 800 words & fig.)

**1947** **625 .28 (73)**
Proceedings, Institution of Mechanical Engineers, 1947, Vol. 157, War Emergency issue No. 30, p. 245.
KIEFER (P.W.). — **Railway power plan** from the United States point of view. (3 000 words, tables & fig.)

**1948** **621 .133 .1 (4**
Journal & Proceedings, Institution of Mechanical Engineers, March, p. 384.
SPARKS (C.H.). — The future of **pulverized coal** Great Britain. (14 000 words & fig.)

**1948** **625 .28 (4**
Journal & Proceedings, Institution of Mechanical Engineers, March, p. 404.
DIAMOND (E.L.). — The **development of locomoti power at speed.** (26 000 words, tables & fig.)

## The Locomotive. (London.)

**1948** **621 .132 .3 (56) & 621 .132 .5 (5**
The Locomotive, April 15, p. 50.
**2-10-0 locomotives. Turkish State Railways.** (2 words & fig.)

**1948** **621 .132 (4**
The Locomotive, April 15, p. 51.
**London Midland Region locos with Caprotti gea** (800 words & fig.)

**1948** **621 .132 .1 (48**
The Locomotive, April 15, p. 56.
AHLBERG (Nils). — **Swedish steam locomotiv** (Continued.) (600 words & fig.)

**1948** **621 .132 .3 (4**
The Locomotive, April 15, p. 59.
**4-8-0 locomotive, French National Railways.** (5 words & fig.)

## Mechanical Engineering. (New York.)

**1948** **621 .133 (7**
Mechanical Engineering, March, p. 246.
**High-pressure locomotive boiler.** (600 words.)

**1948** **621 .132 .8 (73) & 621 .438 (7**
Mechanical Engineering, March, p. 248.
YELLOTT (J.I.), BROADLEY (P.R.) and KOT CAMP (C.F.). — The **coal-burning gas-turbine locom tive.** (1 800 words & fig.)

**1948** **625 .24 (7**
Mechanical Engineering, March, p. 253.
COTTRELL (R.B.). — **Freight-car constructi** (1 200 words & fig.)

**1948** **625 .24 (7**
Mechanical Engineering, March, p. 254.
BORUCKI (R.B.) and SIPP (E.A.). — **Weight red tion. — Freight cars.** (400 words.)

**1948** **625 .24 (7**
Mechanical Engineering, March, p. 254.
HAUSER (G.B.). — **Freight-car construction.** (2 words.)

**1948** **625 .24 (73)**
Mechanical Engineering, March, p. 254.
SUDDUTH (H.N.). — **Weight reduction. Freight cars**: A.A.R. standard air brake — AB single-capacity freight-brake equipment. (200 words.)

---

**1948** **625 .24 (73)**
Mechanical Engineering, March, p. 255.
STUEBING (A.F.). — Economics of application of high strength steel in **freight cars.**

---

## Modern Transport. (London.)

**1948** **621 .438 (73)**
Modern Transport, January 17, p. 7.
Chesapeake and Ohio **motive power developments.** A remarkable coal-fired **turbine-electric locomotive.** (1 000 words & fig.)

---

**1948** **385 (09 (.42)**
Modern Transport, January 24, p. 3; February 7, p. 15.
**Twenty-five years of British Railways** (to be continued). 2 400 words.)

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**1948** **656 .283 (.42)**
Modern Transport, January 31, p. 15.
**Doncaster rear collision.** Summary of official report. (2 000 words.)

---

**1948** **621 .134 .1 (.42)**
Modern Transport, February 7, p. 19.
TUPLIN (W.A.). — **Locomotive cylinder layout.** (1 000 words & fig.)

---

**1948** **385 (09 (.42)**
Modern Transport, February 14, p. 3.
**Railway construction in Italy.** (1 200 words & fig.)

---

## The Oil Engine and Gas Turbine. (London.)

**1948** **656 .222 .1 (42)**
The Oil Engine and Gas Turbine, April, p. 398.
With No. 10 000 in service. Impressions from the « Footplate » of the L.M.S.R. designed 1 600 b.h.p. **Diesel-electric locomotive.** (1 200 words & fig.)

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**1948** **625 .23 (0 (42)**
The Oil Engine and Gas Turbine, April, p. 405.
**Increased capacity for passenger vehicles.** Seating accommodation in trains, railcars and buses. (400 words & fig.)

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## Proceedings, American Society of Civil Engineers. (New York.)

**1948** **721 .2 (01**
Proceedings, American Society of Civil Engineers, No. 1, January.
**Lateral earth pressures on flexible retaining walls.** (158 pages, illustrated.)

## Railway Age. (New York.)

**1948** **656 .225 (.73) & 656 .261 (73)**
Railway Age, January 31, p. 49.
**L.C.L. containers in experimental service.** (600 words & fig.)

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**1948** **656 .254 (73)**
Railway Age, February 7, p. 42.
**Traffic congestion relieved by C.T.C.** (1 000 words & fig.)

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**1948** **721 .5 (42) & 721 .9 (42)**
Railway Age, February 7, p. 50.
M'ILMOYLE (R.L.). — British rebuild engine-shed **roofs with precast concrete units.** (1 800 words & fig.)

---

**1948** **625 .28 (73)**
Railway Age, February 7, p. 56.
**Locomotive inspection report.** (1 500 words & tables.)

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**1948** **621 .438 (73)**
Railway Age, February 14, p. 48.
NEWTON (J.S.). — **Coal-burning steam-turbine locomotive.** (1 200 words & fig.)

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**1948** **621 .131 .1 (73) & 621 .431 .72 (73)**
Railway Age, February 14, p. 54.
**Expands diesel fuel storage capacity.** (1 200 words, map & fig.)

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## Railway Engineering and Maintenance. (Chicago.)

**1948** **625 .142 (73)**
Railway Engineering and Maintenance, April, p. 393.
**Nine-foot crosstie** gets clean bill of health. (1 400 words & fig.)

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**1948** **691 (73)**
Railway Engineering and Maintenance, April, p. 396.
BOASE (A.J.). — **How to get better concrete on the railroads.** Basic principles. (1 400 words & fig.).

---

**1948** **625 .14 (481)**
Railway Engineering and Maintenance, April, p. 404.
SKAVEN HAUG (S.V.). — **Norse make scientific attack on heaving track.** (2 200 words & fig.)

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**1948** **621 .431 .72 (73)**
Railway Engineering and Maintenance, April, p. 407.
**Treating water for Diesel locomotives.** (1 200 words & fig.)

---

## Railway Magazine. (London.)

**1948** **621 .131 .3 (42)**
Railway Magazine, March-April, p. 120.
ALLEN (Cecil J.). — **British locomotive practice and performance.** (2 000 words.)

**1948** **621 .131 .3 (42)**
Railway Magazine, May-June, p. 188.
ALLEN (Cecil J.). — **British locomotive practice and performance.** (2 000 words & tables.)

---

## Railway Mechanical Engineer. (New York.)

**1948** **621 .133 .3 (.73)**
Railway Mechanical Engineer, January, p. 91.
WENTZ (S.F.). — **Flue and tube removal and application.** (700 words.)

---

**1948** **621. 333 (.73)**
Railway Mechanical Engineer, January, p. 100.
HORSTKOTTE (E.H.). — **Tight traction motor coils.** (1 200 words & fig.)

---

## University of Illinois Bulletin. (Urbana.)

**1947** **624 (0 (73)**
University of Illinois Bulletin, No. 8, Sept. 19.
**Studies of highway skew slab bridges with curves.** Part I: Result of analyses. (62 pages, illustrated.)

---

**1947** **697 (73)**
University of Illinois Bulletin, No. 9, Sept. 24.
FELLOWS (J.R.), KRATZ (A.P.) and KONZO (S.). — **The Illinois smokeless furnace.** (78 pages, illustrated.)

---

**1947** **62 (01 (73)**
University of Illinois Bulletin, No. 10, Sept. 29.
WILSON (W.M.) and BURKE (J.L.). — **Rate of propagation of fatigue cracks in 12-inch by 3/4-inch steel plates with severe geometrical stress-raisers.** (14 pages, illustrated.)

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# In Danish. (= 439.81.)

## Sikringsteknikeren. (Copenhagen.)

**1948** **656 .257 (489) = 439 .81**
Sikringsteknikeren, No. 3, March, p. 299.
HANSEN (W.). — Distribution of electric current to electrical safety apparatus. (3 700 words & fig.)

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# In Spanish.

## Ferrocarriles y Tranvias. (Madrid.)

**1947** **385. (09 (.494)**
Ferrocarriles y Tranvias, diciembre, p. 527.
LUCINI (M.). — **Los ferrocarriles federales suizos.** (3 000 palabras.)

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**1947** **621 .31**
Ferrocarriles y Tranvias, diciembre, p. 530.
VILLAR LOPESINO (M.) & DIEZ TORRES (R.). — Controversia sobre una curiosa paradoja mecánica « aparente » de las **transmisiones por ruedas de fricción** en los grupos electrógenos locomotora-alternador. (4 500 palabras.)

---

**1947** **347 .763 .4**
Ferrocarriles y Tranvias, diciembre, p. 535.
ROLDAN (E.). — **La solidaridad de los porteadores en los transportes ferroviarios combinados.** (4 000 palabras.)

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**1947** **656 .282**
Ferrocarriles y Tranvias, diciembre, p. 547.
CAMARA NINO (R.). — Una posible solución económica para detener los **escapes de vagones.** (2 000 palabras & fig.)

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**1947** **625 .216**
Ferrocarriles y Tranvias, diciembre, p. 550.
CABRERA (F.). — **Parachoques con caja de arena.** (1 200 palabras & fig.)

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## Revista de Ciencia aplicada. (Madrid.)

**1947** **721**
Revista de Ciencia aplicada, nº 1, octubre-diciembre, p. 3.
GARCIA ORTEGA (M.). — **Estructuras reticulares.** (3 500 palabras & fig.)

---

**1947** **621 .392 & 665 .88**
Revista de Ciencia aplicada, nº 1, octubre-diciembre, p. 36.
MIRO RAMONACHO (M.). — Tendencias actuales de la **soldadura y técnicas afines.** (4 500 palabras & fig.)

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# In Italian.

## L'Ingegnere. (Milano.)

**1947** **624 .2**
L'Ingegnere, agosto, p. 547.
COLLURA (P.). — Ricerche teorico-pratiche per il collaudo statico di strutture in cemento armato lesionate calcolate come **travi continue** e realizzate come telai dissimmetrici. (2 500 parole & fig.)

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**1947** **621 .438**
L'Ingegnere, agosto, p. 555.
RUBBO (V.). — La **turbina a gas** a ciclo aperto. (4 000 parole & fig.)

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**1947/48** **721 .1 (.45)**
L'Ingegnere, nov.-dicembre, p. 807; gennaio, p. 25.
SANSONI (R.). — **Fondazioni** su pali trivellati. (7 000 parole, tabelle & fig.)

### Ingegneria ferroviaria. (Roma.)

**1948** **385 (09 (.45) & 623 (.45)**
Ingegneria ferroviaria, febbraio, p. 73.
BELLOMI (C.) & CUTTICA (A.). — **La ricostruzione delle F.S.** alla fine del 1947. (7 000 parole, tavole & fig.)

**1948** **621 .132 .8 (.45)**
Ingegneria ferroviaria, febbraio, p. 107.
CROSTI (P.). — **Il sistema Franco-Crosti di fronte ad alcune critiche.** (5 000 parole & fig.)

**1948** **624 (.45)**
Ingegneria ferroviaria, marzo, p. 145.
LO CIGNO (E.). — La **ricostruzione dei ponti ferroviari.** (6 000 parole, tavole & fig.)

**1948** **625 .2 : 625 .62 (.494)**
Ingegneria ferroviaria, marzo, p. 153.
MASINO (G.). — Rinnovamento del **materiale mobile delle tramvie** di Zurigo. (5 000 parole & fig.)

**1948** **621 .438**
Ingegneria ferroviaria, marzo, p. 165.
CHIAPPI (A.). — Lo scambiatore di pressione in una nuova applicazione ferroviaria delle **turbine a gas.** (2 000 parole & fig.)

**1948** **624 .2**
Ingegneria ferroviaria, marzo, p. 169.
DALL' AGLIO (B.). — Metodo elementare di **calcolo delle travi prefabricate in calcestruzzo precompresso.** (1 000 parole & fig.)

**1948** **656 .23 (.45)**
Ingegneria ferroviaria, marzo, p. 175.
LANDRA (A.). — **L'andamento dei traffici** delle F.S. dal 1939 al 1947. (2 000 parole & fig.)

## In Polish (= 91.885.)

### Przeglad Komunikacyjny. (Warsaw.)

**1947** **621 .33 (.42) = 91 .885**
Przeglad Komunikacyjny, No. 12, p. 401.
ARLITEWICZ (J.). — **Electrification and motorization** of the British Railways. (1 000 words.)

**1947** **656 .211 .7 (.438 + .485) = 91 .885**
Przeglad Komunikacyjny, No. 12, p. 422.
BISSAGA (T.). — **Ferry communication** between Poland and Sweden. (500 words & map.)

**1947** **656 .1 & 656 .2 = 91 .885**
Przeglad Komunikacyjny, No. 12, p. 434.
KRZYZANOWSKI (A.). — **Railway and motor transport.** (7 000 words.)

## In Portuguese.

### Técnica. (Lisboa.)

**1948** **721 .9**
Técnica, nº 179, janeiro, p. 677.
BRAVO (M.). — **Calculo de secçôes rectangulares de betâo armado,** com armadura dupla. (1 000 palavras & fig.)

**1948** **691**
Técnica, nº 179, janeiro, p. 681.
BRAZAO FARINHA (S.). — Abaco para **doseamento de betoês.** (1 500 palavras & fig.)

**1948** **693**
Técnica, nº 180, fevereiro, p. 763.
PINTO FONSECA (J.F.). — Contribuiçâo para o estudo da **composiçâo dos aglomerados de cimento.** (1 000 palavras & fig.)

## In Swedish. (= 439.71)

### Meddelanden fran Svenska Lokaltrafik Föreningen. (Stockholm.)

**1948** **656 .234 (.485) = 439 .71**
Meddelanden fran Svenska Lokaltrafik Föreningen, No. 1, p. 8.
NILSSON (N.). — Various systems of tickets. Summary of a lecture at the annual meeting of the Svenska Lokaltrafik Föreningen at Uppsala, 1947. (6 600 words & fig.)

### Nordisk Järnbanetidskrift. (Stockholm.)

**1947** **656 .257 (.485) = 439 .71 & 656 .283 (.485) = 439 .71**
Nordisk Järnbanetidskrift, No. 11, p. 357.
HARD (T.). — Collisions of trains at stations with free levers system at ends of block sections. (3 300 words & fig.)

**1947** **656 .254 (42) = 439 .71**
Nordisk Järnbanetidskrift, No. 11, p. 366.
HARD (T.). — Use of the self-acting braking in Great Britain. (450 words.)

### Sparväg och Buss. (Stockholm.)

**1948** **656 .211 (.485) = 439 .71**
Sparväg och Buss, No. 3, March, p. 40.
BYLUND (S.). — Suburban station at Alvik. (1 300 words & fig.)

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## I. — BOOKS.

### In French.

**1948** **69**

**BERNARD (F.) et TOURANCHEAU (A.-L.).**

**Eléments de construction à l'usage de l'ingénieur. Tome I : Généralités.**

Paris, Dunod, éditeur. 1 volume (16×25 cm.) de 132 pages, avec 279 figures. (Prix : 190 fr. français.)

**1947** **347 .763 .4**

**CALOT (Ch.).**

**Le droit commercial appliqué au transport par chemin de fer.**

Paris, Editions Léon Eyrolles. 1 volume (16×25 cm.) de 292 pages.

**1947** **62. (01 & 669**

**CHENEVARD (P.).**

**L'essai micromécanique des métaux.**

Zurich, Rapport nº 42 de l'Association suisse pour l'essai des matériaux. 1 brochure in-4º de 38 pages et 58 figures.

**1948** **669 .1**

**OFFICE TECHNIQUE POUR L'UTILISATION DE L'ACIER.**

**Album de produits sidérurgiques.**

Paris (8e), OTUA, 25, rue du Général Foy. 1 brochure de 84 pages, avec tableaux & figures.

**1948** **385. (08 (493)**

**SOCIETE NATIONALE DES CHEMINS DE FER VICINAUX (Belgique).**

**Rapports présentés par le Conseil d'administration et par le Comité de Surveillance,** 63e exercice social. Année 1947.

Bruxelles, Imprimerie H. & M. Schaumans, 41, parvis Saint-Gilles. 1 volume (23×30 cm.) de 132 pages, avec 1 carte hors texte.

### In English.

**1948** **621 .431 .72 (42)**

**ADAMS (Orville L.).**

**Diesel operation and maintenance.**

London : Chapman and Hall, Ltd., 37, Essex Street, W.C.2. (Price : 28s.)

**1948** **385 (09 (42)**

**BELL (R.).**

**History of the British Railways during the War 1939-1945, with a foreword by Sir William V. WOOD.**

London : « The Railway Gazette », 33, Tothill Street, Westminster, S.W.1. Limited Library Edition. — Heavy paper. (Price : 30s.9d. by post.)

**1948** **691 & 721 .9**

**GREEN (Noel D.).**

**Concrete and contractors.**

London : Crosby, Lockwood and Son Ltd. (Price : 12s.6d. net.)

**1948** **691**

**MURDOCK (Dr. L.J.).**

**Concrete materials and practice.**

London : Edward Arnold and Company, 41 and 43, Maddox Street, W.1. (Price : 21s. net.)

**1948** **385 (09 (42)**

**PRYS GRIFFITHS (R.).**

**The Cheshire lines railway.**

The Oakwood Press, « Tanglewood », South Godstone, Surrey.

(Price : 6s.6d. net [paper covers] ; 8s.6d. net [cloth bound].)

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(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509)

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# II. — PERIODICALS.

## In French.

### Bulletin Sécheron. (Genève.)

**1946** **621 .335 (.494)**
Bulletin Sécheron, n° 18F, p. 1.
WERZ (H.). — Les **locomotives légères type Re4/4** des Chemins de fer fédéraux suisses. (4 000 mots & fig.)

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**1946** **621 .335 (.494)**
Bulletin Sécheron, n° 18F, p. 9.
WERZ (H.). — Les **rames automotrices légères** de la Compagnie du Lötschberg (BLS). (2 500 mots & fig.)

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**1946** **621 .392 (.494) & 625 .143 .4 (.494)**
Bulletin Sécheron, n° 18F. p. 16.
WÖRTMANN (F.) et MÜLLER (R.). — Le **soudage des joints de rails,** procédé « Sécheron ». (5 000 mots & fig.)

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### Economie et Technique des Transports. (Lucerne.)

**1947** **625 .2**
Economie et technique des transports, n° 70, juin, p. 46; n° 73, septembre, p. 90.
SUTTER (K.). — **Calcul des caisses auto-portantes de voitures** de chemin de fer. (6 000 mots, tableaux & fig.)

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**1947** **621 .335**
Economie et technique des transports, n° 70, juin, p. 52.
HUG (Ad.-M.). — **Rames motrices rapides et poids non suspendu.** (1 000 mots & fig.)

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**1947** **621 .335 (.494) & 621 .338 (.494)**
Economie et technique des transports, n° 73, septembre, p. 84.
BERTSCHMANN (J.). — Chemin de fer Rhétique. **Amélioration du matériel roulant et modernisation,** 1939-1946 (suite). (2 500 mots & fig.)

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### Génie Civil. (Paris.)

**1948** **62. (01**
Génie Civil, n° 3227, 15 avril, p. 151.
LEFAUDEUX (G.). — Les **efforts de traction dans les coupoles.** (1 600 mots & fig.)

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**1948** **621 .138 .1 (44) & 725 .33 (44)**
Génie Civil, n° 3228, 1er mai, p. 161.
CALFAS (P.). — Les **nouvelles remises à locomotives** de la S.N.C.F. La rotonde du dépôt d'Avignon (Vaucluse). (2 600 mots & fig.)

**1948** **621 .138**
Génie Civil, n° 3229, 15 mai, p. 196.
**L'évacuation continue des boues formées dans la chaudière** des locomotives après addition de désentartreur. (250 mots & fig.)

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### La Route du Rail (Rail et Route). (Paris.)

**1947** **621 .431 .72 (.44**
La Route du Rail, mai, p. 4.
GALLET (A.). — Les **nouveaux types d'autorails et d'autocars** S.N.C.F. (1 500 mots & fig.)

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**1947** **625 .16**
La Route du Rail, mai, p. 17.
COLNAT (A.). — Les **passages à niveau.** (2 600 mots & fig.)

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**1947** **385. (09 (.47**
La Route du Rail, 15 juin, p. 5.
KOVALEV (I.). — Les **Chemins de fer de l'U.R.S.S.** en 1946. (1 000 mots.)

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**1947** **625 .2 (.4**
La Route du Rail, 15 juin, p. 17.
**L'identification du matériel roulant** en Europe. (1 200 mots & fig.)

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**1947** **624 (.44) & 656 .213 (.44**
La Route du Rail, 15 juillet, p. 1; septembre, p. 4.
RUBINSTEIN (J.). — Le **futur port de Paris et les ouvrages** de la S.N.C.F. sur la Seine. (6 000 mots & fig.)

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**1947** **385. (09 (.71**
La Route du Rail, 15 juillet, p. 9.
Le **Canadian Pacific** et son œuvre de développement au Canada. (2 500 mots & fig.)

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**1947** **656 .222 .5 (.44**
La Route du Rail, 15 juillet, p. 14; septembre, p. 13.
GOUDARD (J.). — La **desserte de la banlieue parisienne** par la S.N.C.F. (10 000 mots & fig.)

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**1947** **385. (09 (.494**
La Route du Rail, septembre, p. 1.
MARGUERAT (A.). — **Chemin de fer Viège-Zermatt.** (1 500 mots & fig.)

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**1947** **385. (09 (.42**
La Route du Rail, septembre, p. 9.
Les **Chemins de fer britanniques.** (1 500 mots & fig.)

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**1947** **656 .1 (.47) & 656 .2 (.44**
Rail et Route, novembre, p. 4; décembre, p. 3.
Les divers modes de **transports mixtes rail-route.** (6 000 mots & fig.)

## Revue générale des chemins de fer. (Paris.)

**1948** **625 .172 (44)**
Revue générale des chemins de fer, avril, p. 109.
LÉVI (R.). — L'évolution de l'**entretien des voies.** (8 000 mots & fig.)

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**1948** **625 .24 (44) & 625 .26 (44)**
Revue générale des chemins de fer, avril, p. 121.
MASSERAN. — **Montage** en France **des éléments de wagons** commandés aux Etats-Unis. (5 000 mots & fig.)

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**1948** **656 .254 (44)**
Revue générale des chemins de fer, avril, p. 130.
RIOU (C.). — Le **poste de commandement régional** de la Traction sur la Région du Sud-Ouest. (1 100 mots & fig.)

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**1948** **621 .93 (44)**
Revue générale des chemins de fer, avril, p. 132.
DEHEN. — Confection et réparation des **outils de coupe.** Exemple du Centre Réparateur de La Chapelle. (2 700 mots & fig.)

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**1948** **656 .237 (44)**
Revue générale des chemins de fer, avril, p. 136.
MATHEZ. — Réforme et mécanisation de la **comptabilité des remboursements.** (2 500 mots & fig.)

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## Trains. (Bruxelles.)

**1947** **625 .1 (.493) & 625 .13 (.493)**
Trains, août, p. 5.
CASTIAU (M.). — La **jonction Nord-Midi.** Son but — Son histoire. (4 500 mots & fig.)

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**1947** **625 .1 (.493) & 625 .13 (.493)**
Trains, août, p. 15.
FRANCHIMONT (E.) — Les **grands travaux de la jonction ferroviaire Nord-Midi** à Bruxelles. Justification des particularités techniques de son tunnel. (10 000 mots, planche & fig.)

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**1947** **625 .13 (.493)**
Trains, août, p. 39.
THOREAU (J.). — **Problèmes hydrologiques et géologiques dans les travaux de la jonction Nord-Midi.** La granulométrie des terrains. (4 000 mots.)

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# In German.

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## Glasers Annalen. (Berlin.)

**1948** **621 .431 .72 (.43)**
Glasers Annalen, Heft 3, März, S. 33.
NEUMANN (A.). — Die **Entwicklung der dieselhydraulischen Motorlokomotive** in Deutschland. (6 000 Wörter & Abb.)

**1948** **621 .132 .8 (73) & 621 .438 (73)**
Glasers Annalen, Heft 3, März, S. 39.
WOLFF (A.). — Die **turboelektrischen Lokomotiven** der Chesapeake und Ohio-Bahn. (4 000 Wörter & Abb.)

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**1948** **621 .132 .6 (43)**
Glasers Annalen, Heft 3, März, S. 43.
EWALD (K.). — Die beiden **Stromlinien-Tenderlokomotiven Reihe 61** der Deutschen Reichsbahn. (1 500 Wörter, Tabellen & Abb.)

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**1948** **621 .132 .8**
Glasers Annalen, Heft 4, April, S. 49.
Dr. METZELTIN. — Die **Entwicklung der Franco-Lokomotive.** (1 300 Wörter & Abb.)

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**1948** **621 .134 .3**
Glasers Annalen, Heft 4, April, S. 59.
Für und wider die **Ventilsteuerung an Dampflokomotiven.** (3 000 Wörter.)

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## Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik. (Zürich.)

**1948** **385 .13**
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr. 1, S. 1.
GROSSMANN (E.). — Der **Verkehr als Steuerobjekt.** (8 000 Wörter.)

---

**1948** **656 .235 (.494)**
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr. 1, S. 21.
HEROLD (H.). — Die **Neugestaltung der Schweizerischen Gütertarife.** (6 000 Wörter & 6 Tabellen.)

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**1948** **385 .1**
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr. 1, S. 62.
REINHARD MEYER (H.). — Eine Einzelfrage aus der **Finanz- und Betriebswirtschaft der Eisenbahnen.** (2 400 Wörter.)

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# In English.

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## The Engineer. (London.)

**1948** **621 .132 .1 (42)**
The Engineer, Febr. 6, p. 128; Febr. 13, p. 152.
NOCK (O.S.). — **Present day locomotive working** in Great Britain. (To be continued.) (4 200 words & fig.)

**1948** **621 .431 .72 (42)**
The Engineer, Febr. 6, p. 137.
**Diesel-electric main line locomotive trials.** (400 words.)

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**1948** **385 (09 (71)**
The Engineer, Febr. 20. p. 176; Febr. 27, p. 200; March 5, p. 224.
LIVESAY (E.H.). — **The Crowsnest line, C.P.R.** (10 600 words & fig.)

**1948** **621 .132 .1 (42)**
The Engineer, Febr. 20, p. 190.
**Locomotive developments at Crewe.** (2 400 words & fig.)

**1948** **621 .392 & 669 .1**
The Engineer, Febr. 27, p. 208.
**Ductility of steels for welded structures.** (1 800 words & fig.)

## Engineering. (London.)

**1948** **621 .132 .3 (42) & 621 .132 .5 (42)**
Engineering, No. 4281, Febr. 13, p. 151.
**New « A2 » class express locomotives, L.N.E.R.** (400 words & fig.)

**1948** **621 .431 .72 (42)**
Engineering, No. 4282, Febr. 20, p. 176.
**400 H.P. Diesel-electric locomotive.** (1 600 words & fig.)

**1948** **621 .431 .72 (42)**
Engineering, No. 4282, Febr. 20, p. 181.
**Main-line Diesel locomotives.** (1 400 words.)

**1948** **621 .9 (42)**
Engineering, No. 4282, Febr. 20, p. 189.
EATOUGH (C.). — Modern **cutting tools and machine tools** design. (3 200 words & fig.)

**1948** **621 .131 .3 (73)**
Engineering, No. 4283, Febr. 27, p. 193.
POULTNEY (E.C.). — **Tests of 4-4-4-4 passenger locomotive,** Pennsylvania Railroad. (3 600 words & fig.)

**1948** **621 .138 (42) ; 721 .5 (42) & 721 .9 (42)**
Engineering, No. 4283, Febr. 27, p. 199.
**Reinforced-concrete locomotive sheds.** (3 000 words & fig.)

## Journal, Permanent Way Institution. (London).

**1948** **625 .142 .4 (42)**
Journal Permanent Way Institution, April, p. 39.
SWINNERTON (N.W.). — **Concrete sleepers.** (2 600 words & fig.)

**1948** **625 .13 (41)**
Journal Permanent Way Institution, April, p. 53.
CAIN (N.C.). — **Reconstruction of the Roe Viaduct.** (2 200 words & fig.)

## Mechanical Engineering. (New York.)

**1948** **621 .133 (73)**
Mechanical Engineering, March, p. 256.
HUSTON (F.P.). — Notes on **the design and construction of staybolt locomotives.** (200 words.)

## Modern Transport. (London.)

**1948** **656 .2 (.42**
Modern Transport, February 14, p. 5.
**Zoning on railways.** (1 000 words.)

**1948** **656 .283 (.42**
Modern Transport, February 14, p. 7.
**Abuse of release key.** Report on **South Croydon collision.** (1 800 words.)

**1948** **656 .211 .5(.42**
Modern Transport, February 14, p. 14.
**Modernisation of railway booking offices.** (600 word & fig.)

**1948** **385 .58 (.42**
Modern Transport, February 14, p. 16.
**Administration of railway staff.** (1 400 words.)

**1948** **625 .13 (.42) & 625 .17 (.42**
Modern Transport, February 21, p. 3.
**Track renewal and drainage on railways.** Souther Region introduces preassembled track technique in Pol hill tunnel. (1 400 words & fig.)

**1948** **625 .212 (.44**
Modern Transport, February 21, p. 11 ; March 6, p. 12
**Pneumatic tyres on railways.** (1 600 words.)

**1948** **621 .132 .7 (68**
Modern Transport, February 28, p. 12.
Building locomotive in South Africa. **The S.A.R. clas S1 0-8-0 shunter.** (800 words & fig.)

**1948** **656 .225 (42) & 656 .261 (42**
Modern Transport, March 6, p. 5.
Delivering coated roadstone. **Road-rail container deve lopments.** (900 words & fig.)

**1948** **621 .133 .1 (82**
Modern Transport, March 6, p. 6.
**Oil-fired locomotives.** — Experience in Argentina (300 words.)

**1948** **625 .23 (42**
Modern Transport, March 13, p. 3.
**History of British Railway carriages.** — 46. — Th famous Royal trains of the S.E. and C. and L.N.W. Rai ways. (Concluded.) (1 300 words & fig.)

## The Oil Engine and Gas Turbine (London.)

**1948.** **621 .431 .72 (42**
The Oil Engine and Gas Turbine, May, p. 15.
**Oil-engined British main-line locomotives.** (1 200 word & fig.)

**1948** **621 .431 .72 (41**
The Oil Engine and Gas Turbine, May, p. 24.
**Dublin built Diesel shunter.** Dual purpose design c 487 b.H.P. rating. Electric transmission.

## Railway Age. (New York.)

**1948** 656 .212 (73)

Railway Age, February 14, p. 59.
OPSAHL (C.R.). — Railroad **materials handling problem.** (1 600 words & fig.)

**1948** 625 .246 (73)

Railway Age, February 14, p. 62.
DOWNES (M.S.). — **Roller bearings for freight cars.** (1 000 words.)

**1948** 625 .143 .3 (73)

Railway Age, February 14, p. 64.
**Fabco tie pads.** (400 words & fig.)

**1948** 656 .256 .2 (73)

Railway Age, February 21, p. 42.
**New interlocking** effects big savings. (500 words & fig.)

**1948** 625 .243 (73)

Railway Age, February 21, p. 45.
Application of « Damage free » loader **modernizes standard box car.** (400 words & fig.)

**1948** 621 .33 (73)

Railway Age, February 21, p. 46.
BIRCH (L.W.). — **Do first costs retard electrification?** (1 800 words & fig.)

**1948** 625 .232 (73)

Railway Age, February 21, p. 50.
**Pennsylvania's overnight coaches.** (2 400 words & fig.)

**1948** 621 .431 .72 (42)

Railway Age, February 28, p. 42.
Poultney (E.C.). — L.M.S. installs **main line Diesels.** (1 800 words & fig.)

**1948** 656 .212 .7 (73)

Railway Age, March 6, p. 42.
VARNUM (G.W.). — This **new freighthouse** has everything. (2 000 words & fig.)

**1948** 669 (73)

Railway Age, March 6, p. 54.
ELLIOTT (V.E.) & MEYETTE (C.L.). — Determining the origin of **surface defects in rolled steel products.** (1 200 words & fig.)

**1948** 625 .144 .4 (73)

Railway Age, March 13, p. 62.
**New and improved products** of the manufacturers. (9 000 words & fig.)

**1948** 621 .131 .2

Railway Age, March 13, p. 82.
GIESL-GIESLINGEN (A.). — **Tendencies in front-end design.** (2 200 words & fig.)

**1948** 621 .431 .72 (73)

Railway Age, March 20, p. 60.
**Locomotive gas-turbine demonstrated.** (200 words & fig.)

**1948** 625 .24 (73)

Railway Age, March 27, p. 38.
BORUCK (R.B.) & SIPP (E.A.). — **Aluminum in freightcar construction.** (2 200 words, tables & fig.)

**1948** 621 .133 (73)

Railway Age, March 27, p. 48.
A **high-pressure locomotive boiler.** (600 words & fig.)

## In Spanish.

### Boletin de la Asociación Permanente del Congreso Panamericano de Ferrocarriles. (Buenos Aires.)

**1948** 621 .33 (82)

Boletin de la Asociación Perm. del Congreso Panameric. de Ferrocarriles, enero-febrero, p. 107.
**Estadistica de 50 años de tracción electrica** en la ciudad de Buenos Aires. (1 000 palabras & fig.)

**1948** 385. (09 (87)

Boletin de la Asociación Perm. del Congreso Panameric. de Ferrocarriles, enero-febrero, p. 122.
**Reseña historica y tecnica de los ferrocarriles** de Venezuela. (1 200 palabras & cuadro.)

### Ferrocarriles y Tranvias. (Madrid.)

**1948** 385 .4 (42)

Ferrocarriles y Tranvias, enero, p. 3.
WAIS (F.). — La **nueva organización** de los ferrocarriles ingleses. (4 000 palabras & fig.)

**1948** 656 .254

Ferrocarriles y Tranvias, enero, p. 10.
LIARTE (M.L.). — Los sistemas de **gobierno automático de trenes y señalización continua** en las locomotoras. (8 000 palabras & fig.)

**1948** 656 .222 .1

Ferrocarriles y Tranvias, enero, p. 31.
NUNEZ ALVAREZ (E.). — **Aumento de velocidad** en el transporte de viajeros. (1 500 palabras & fig.)

## In Italian.

### Ingegneria ferroviaria. (Roma.)

**1948** 621 .33

Ingegneria ferroviaria, aprile, p. 201.
FOCACCIA (B.) & CARAFA (M.). — **Distribuzione del potenziale e della corrente dispersa.** (3 000 parole & fig.)

**1948** 621 .33 (09

Ingegneria ferroviaria, aprile, p. 209.
GIORGI (G.). — I primordi della tecnica della **trazione elettrica.** (4 000 parole & fig.)

1948 656 .2 (45)
Ingegneria ferroviaria, aprile, p. 215.
MARIN (F.). — **Miglioramenti nell' esercizio ferroviario.** (2 200 parole & tavole.)

1948 621 .335
Ingegneria ferroviaria, aprile, p. 219; maggio, p. 295.
NOTARI (M.). — Le **vibrazioni elastiche quasi-armoniche nel biellismo dei locomotori elettrici.** (4 500 parole & fig.)

1948 621 .431 .72 (45)
Ingegneria ferroviaria, aprile, p. 225.
CUTTICA (A.). — Ricostruzione del **parco automotrici termiche** delle F.S. (5 000 parole & fig.)

1948 625 .143 .3
Ingegneria ferroviaria, aprile, p. 231.
DI TARSIA (E.). — Appunti sulla **marezzatura delle rotaie.** (3 000 parole & fig.)

1948 621 .392 & 624
Ingegneria ferroviaria, aprile, p. 238.
CACCIOPPOLI (L.). — **Considerazioni sulle strutture soldate.** (2 400 parole & fig.)

## Ricerca scientifica e ricostruzione. (Roma.)

1947 693
Ricerca scientifica e ricostruzione, dicembre, p. 2006.
DARDANELLI (G.). — Indagine statistica sulla **resistenza dei cementi** negli anni 1945 — 1946 — 1947. (1 600 parole, tabelle & fig.)

1948 62. (01
Ricerca scientifica e ricostruzione, gennaio-feb., p. 103.
BORDONI (P.-G.). — Metodo elettroacustico per **ricerche sperimentali sulla elasticità.** (2 200 parole & fig.)

## Trasporti pubblici. (Roma.)

1947 656 (45)
Trasporti Pubblici, ottobre, p. 1019.
RIZZO (G.). — I **trasporti terrestri** e la nuova costituzione. (9 000 parole.)

1947 621 .33 & 625 .6
Trasporti Pubblici, ottobre, p. 1073.
SERANI (D.). — Possibilità e convenienza dell' impiego della **trazione elettrica ad accumulatori su linee ferroviarie secondarie.** (3 000 parole, tavola & fig.)

## In Polish (= 91.885)

## Przeglad Komunikacyjny. (Warsaw.)

1948 385. (09 (.47) = 91 .885
Przeglad Komunikacyjny, No. 1, p. 1.
BEISTER (K.). — On the **development of the Finnish Railways.** (5 000 words & map.)

1948 656 .212 .5 = 91 .8
Przeglad Komunikacyjny, No. 1, p. 16.
CZEKAJEWSKA (H.). — **Profile of directing trac on flat marshalling yards.** (6 000 words & fig.)

1948 624 (.438) = 91 .885
691 (.438) = 91 .8
Przeglad Komunikacyjny, No. 1, p. 22.
KEDZIERSKI (B.). — Application of the **new sp cifications PN/B-195 for reinforced concrete for brid calculations.** (1 800 words & fig.)

1948 614 .5 (.438) = 91 .8
Przeglad Komunikacyjny, No. 1, p. 26.
PEZINSKI (W.). — **SO2 as a means to destroy insec and germs** on the Polish State Railways. (2 400 wor & table.)

1948 621 .133 .7 = 91 .8
Przeglad Komunikacyjny, No. 1, p. 31.
SOBCZACK (K.). — **Water system on steam locom tives.** (4 800 words.)

## In Portuguese.

## Gazeta dos Caminhos de ferro. (Lisboa.)

1948 385. (09 (49
Gazeta dos Caminhos de ferro, nº 1444, 16 de fevereir p. 170; nº 1445, 1 de março, p. 183; nº 1446, 16 março, p. 211; nº 1448, 16 de abril, p. 279; nº 145 16 de maio, p. 311.
de AGUILAR (B.). — **Os caminhos de ferro suiço** (5 500 palavras & fig.)

1948 621 .431 .72 (46
Gazeta dos Caminhos de ferro, nº 1447, 1 de abril, p. 25
Os **Caminhos de ferro Portugueses** e a sua modern zação. (1 600 palavras & fig.)

## Revista das Estradas de ferro (Rio de Janeiro

1947 656 (.8
Revista das Estradas de ferro, nº 479, outubro, p. 481
LINS (A.). — A **função das estradas de ferro** n meios de comunicação e trasportes no Brasil. (7 000 p lavras.)

## In Dutch.

## Spoor- en Tramwegen. (Utrecht.)

1948 385. (09 (9
Spoor- en Tramwegen, nr 8, 8 April, p. 113.
OVERDIJKINK (G.-W.-R.). — De **Deli Spoorw Maatschappij.** (5 000 woorden & fig.)

**1948** **656 .211 (494)**
Spoor- en Tramwegen, nr 9, 22 April, p. 134.
HOOFTMAN (J.-C.). — De **uitbreiding van het Centraal Station** te Zurich. (2 500 woorden & fig.)

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**1948** **625 .24**
Spoor- en Tramwegen, nr 12, 3 Juni, p. 177.
BOLLEMAN KIJLSTRA (E.). — **Wagonbouwproblemen.** (5 000 woorden & fig.)

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**1948** **385. (09 (56)**
Spoor- en Tramwegen, nr 12, 3 Juni, p. 184.
De **spoorwegen** in Palestina. (1 500 woorden & kaart.)

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## In Swedish. (= 439.71)

### Nordisk Järnbanetidskrift. (Stockholm.)

**1948** **347 .763 .2 (481)** = 439 .82
Nordisk Järnbanetidskrift, No. 1, p. 4.
HELLAND-HANSEN (K.). — **Law dealing with transport in Norway.** (800 words.)

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**1948** **656 .231 (485)** = 439 .71
Nordisk Järnbanetidskrift, No. 1, p. 6.
SJÖBERG (A.). — **Increase of passenger and freight tariffs** of the Swedish State Railways. (7 600 words & tables.)

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**1948** **625 .111 (485)** = 439 .71
Nordisk Järnbanetidskrift, No. 2, p. 31.
GODLUND (S.). — **Scheme for certain alterations to the Swedish State Railways** system in connection with studies to improve certain relations. (2 300 words & fig.)

### Teknisk Tidskrift. (Stockholm.)

**1948** **656 .25 (485)** = 439 .71
Teknisk Tidskrift, No. 18, April, p. 277.
KARSBORG (A.). — How can signalling systems improve the **safety of traffic** ? (7 200 words.)

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**1948** **656 .254 (73)** = 439 .71
Teknisk Tidskrift, No. 18, April, p. 292.
BOBERG (I.). — **Cab signalling system** used in U.S.A. 1 200 words & fig.)

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**1948** **656 .254 (485)** = 439 .71
Teknisk Tidskrift, No. 18, April, p. 294.
AHLBERG (C.). — **Swedish cab signalling system.** (450 words.)

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**1948** **656 .254 (485)** = 439 .71
Teknisk Tidskrift, No. 18, April, p. 295.
INSULANDER (H.). — **Automatic braking with signal appliances or cab signalling system.** (1 400 words.)

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**1948** **656 .257 (485)** = 439 .71
Teknisk Tidskrift, No. 18, April, p. 297.
LUNDBERG (T.). — **Safety installations in the stations.** (600 words.)

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**1948** **656 .254 (485)** = 439 .71
Teknisk Tidskrift, No. 18, April, p. 298.
HARD (T.). — **Discontinuous or continuous self-acting braking?** (2 100 words & fig.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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**[ 016. 385. (02 ]**

## I. — BOOKS.

### In French.

**1948** **531 (02**

**[C]HAZY (J.).**

**Cours de mécanique rationnelle.** 3e édition revue et augmentée.

Paris, Gauthier-Villars, éditeur. Tome I: 482 pages et 90 figures; tome II: 518 pages et 173 figures. (Prix: tome I, 900 fr. fr.; tome II, 1 100 fr. fr.)

**1948** **621 (02**

**[F]ONTAINE (R.).**

**Formulaire de construction mécanique,** 3e édition.

Paris, Béranger, éditeur. 1 volume (10 × 14 cm.) de 558 pages, avec figures. (Prix: relié, 380 fr. français.)

**1948** **691**

**LE COUR GRANDMAISON (A.).**

**L'industrie du ciment.**

Paris, Société d'Encouragement pour l'Industrie Nationale, 44, rue de Rennes. 1 brochure de 12 pages.

**1946** **621 .132 .8 & 621 .438**

**La locomotive à turbine à gaz Brown-Boveri.**

Baden (Suisse), édité par la S.A. Brown-Boveri & Cie. 1 brochure (21 × 30 cm.) de 16 pages & illustrations.

**1948** **621 .7**

**[P]ERDRIAT (L.).**

**Guide pratique d'atelier à l'usage des directeurs d'usines, chefs d'ateliers et contremaîtres.**

Paris, Dunod, éditeur. 2e édition. 1 volume (12.5 × 16.2 cm.) de 200 pages avec 79 figures. (Prix: broché, 190 fr. français.)

### In English.

**1948** **313 .385 (42)**

**British Transport Commission: Transport statistics.** 1948 series. No. 3. Period to 21 March.

London: British Transport Commission. (Price: 1s.)

**1948** **669**

**BROWN (H.).**

**Aluminium and its application.**

New York N.Y. and London: Pitman Publishing Corporation. Cloth, 5 3/4 × 9 1/4 inches, 338 pp., illus., diagrams, charts, tables. (Price: $ 6.75.)

**1948** **621 .3**

**« Electrical Engineer ». Reference Book.**

Third edition.

London: George Newnes Ltd., Tower House, Southampton Street, Strand, W.C.2. (Price: 42s.)

**1948** **621 .134 .2**

**GREENLY (Henry).**

**Walschaerts' valve gear.**

Revised by STEEL (E.A.).

London: Percival Marshall and Company Ltd., Great Queen Street, 23, W.C.2. (Price: 3s. net.)

**1947** **621 .43**

**HELDT (P.M.).**

**High speed diesel engines.**

Fifth edition.

New York: P.M. Heldt, Nyack, N.Y., 1947. Cloth, 5 × 8 1/2 in., 479 pp., illus., diagrams, charts, tables. (Price: $ 6.)

**1947** **385 (03 (73)**

**Locomotive Cyclopedia of American practice. 1947.**

Thirteenth edition. Edited by R.V. WRIGHT and R.C. ANGOR.

New York: Simmons-Boardman Publishing Corporation. Cloth, 8 × 11 3/4 in., 1 418 pp., illus., diagrams, charts, tables. (Price: $ 8.)

### In Dutch.

**1948** **625 .1**

**BARENTZEN (P.), BAKKER (F.) en BARDET (J.-D.-M.).**

**Grondwerken, Transport- en hulpmiddelen, Gewone wegen, Spoorwegen.**

Amsterdam: Uitgever L.-J. Veen. (Prijs: 9.50 gulden.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

[ 016. 385. (05 ]

## II. — PERIODICALS.

### In French.

#### Annales des Ponts et Chaussées. (Paris.)

**1947** **62. (01**

Annales des Ponts et Chaussées, septembre-octobre, p. 609; novembre-décembre, p. 769.

BONNEAU. — **Equilibre limite et rupture des milieux continus.** (2 900 mots & fig.)

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**1947** **625 .43**

Annales des Ponts et Chaussées, septembre-octobre, p. 655; novembre-décembre, p. 803.

LEHANNEUR. — De quelques questions relatives au **calcul des téléphériques** à voyageurs et d'un essai de freinage réalisé au téléphérique d'Artouste (Basses-Pyrénées). (17 000 mots & fig.)

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**1947** **62. (01**

Annales des Ponts et Chaussées, septembre-octobre, p. 693.

DUMAS (M.). — Introduction des probabilités dans le domaine de la **résistance des matériaux.** (3 000 mots.)

---

**1947** **624 .51 (.73)**

Annales des Ponts et Chaussées, septembre-octobre, p. 699.

**Renforcement de la rigidité du pont suspendu** Bronx Whitestone. (2 000 mots & fig.)

---

#### Bulletin des Transports internationaux par chemins de fer. (Berne.)

**1948** **656 .223 .2**

Bulletin des transports internationaux par chemins de fer, mars, p. 95.

Ebauche d'un **projet de règlement international concernant les transports en wagons de particuliers** (R.I.P.). (8 000 mots.)

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**1948** **385 (435 .9)**

Bulletin des transports internationaux par chemins de fer, mars (annexe), p. 20; avril (annexe), p. 25; mai (annexe), p. 33; juin (annexe), p. 39.

**Statuts** de la Société Nationale des Chemins de fer Luxembourgeois. (8 000 mots.)

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#### Bulletin de l'Union Internationale des Chemins de fer. (Paris.)

**1948** **313 : 385**

Bulletin de l'Union intern. des ch. de fer, mars, p. 90

TORK. — Les échelles logarithmiques dans les **statistiques ferroviaires.** (5 000 mots & fig.)

**1948** **656 .2**

Bulletin de l'Union intern. des ch. de fer, mars, p. 100

JESCHEK (H.). — Réflexions sur les **gares frontiè**

(2 000 mots.)

---

**1948** **656 .225 (.4**

Bulletin de l'Union intern. des ch. de fer, mars, p. 102

Les **transports de « détail »** dans la banlieue parisien

(2 300 mots & fig.)

---

**1948** **656 .2 (.4**

Bulletin de l'Union intern. des ch. de fer, mars, p. 105

Les **services de suggestions du personnel** dans les Chemins de fer britanniques. (3 500 mots.)

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**1948** **656 .225 (.492) & 656 .261 (49**

Bulletin de l'Union intern. des ch. de fer, mars, p. 1(

BORS (H. W. H.). — Les **nouveaux containers** d

Chemins de fer Néerlandais. (3 000 mots & fig.)

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**1948** **656 .222 .5 (494) & 656 .23 (49**

Bulletin de l'Union intern. des ch. de fer, mars, p. 116.

DREYER (G.). — La procédure de **préparation d horaires et des tarifs** des Chemins de fer suisses. (1 7 mots.)

---

#### Génie Civil. (Paris.)

**1948**

Génie Civil, n° 3230, 1er juin, p. 208.

COVIAUX (C.). — L'application des procédés électr niques à l'**étude des sols** par la méthode sismique. (1 5 mots & fig.)

---

**1948** **621 .131 .3 (4**

Génie Civil, n° 3230, 1er juin, p. 212.

Le **nouveau matériel d'essai en ligne des locomotiv** du London Midland and Scottish Railway (Grande-Br tagne). (1 000 mots & fig.)

---

**1948** **621 .433 (4**

Génie Civil, n° 3230, 1er juin, p. 213.

L'**emploi du gaz naturel pour la traction ferroviaire** U.R.S.S. (500 mots & fig.)

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**1948** **624 .32 (4**

Génie Civil, n° 3230, 1er juin, p. 215.

La **reconstruction du pont** de Roppenheim sur le Rhi

(1 000 mots & fig.)

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#### Machines et Métaux. (Paris.)

**1947/1948** **621 .8**

Machines et Métaux, décembre, p. 395; janvier, p. 19.

CAVE. — **Progrès dans la technique des coussinet**

(10 000 mots, tableaux & fig.)

**1947** — **669 .1**
Iachines et Métaux, décembre, p. 419.
Le **vieillissement de l'acier.** (2 000 mots & fig.)

**1948** — **621 .392 & 669 .1**
Iachines et Métaux, mars, p. 85.
LAURENS (J.). — Le **soudage à l'arc des aciers noxydables.** (3 000 mots.)

**1948** — **62. (01 & 669 .1**
Iachines et Métaux, mars, p. 103.
HEDDE d'ENTREMONT (B.). — **Relations** entre les **aractéristiques mécaniques** et la **composition d'un acier.** 2 000 mots & fig.)

## Notre Métier. (Paris.)

**1947** — **385. (09 (.42)**
Notre Métier, 8 juillet, p. 6; 22 juillet, p. 4.
BONNEFON (H.). — Les **Chemins de fer de Grande-Bretagne.** (8 000 mots & fig.)

**1947** — **385. (09 (.494)**
Notre Métier, 9 septembre, p. 4; 30 septembre, p. 4.
LARTILLEUX (H.). — Les **Chemins de fer fédéraux Suisses.** (3 300 mots & fig.).

**1948** — **621 .335 (.494)**
Notre Métier, 6 janvier, p. 4.
L'électrogyro Oerlikon. (Traction électrique sans caténaires, sans 3e rail, sans accumulateurs...) (1 000 mots & fig.)

**1948** — **621 .33 (.44)**
Notre Métier, 16 mars, p. 4.
Les travaux de l'**électrification** Nîmes-Sète. (2 500 mots & fig.)

## Revue générale des chemins de fer. (Paris.)

**1948** — **625 .14 (01 & 625 .143 .4**
Revue générale des chemins de fer, mai, p. 145.
LEVI (R.). — **La déformation des voies par la chaleur.** (3 000 mots & fig.)

**1948** — **656 .212 (44)**
Revue générale des chemins de fer, mai, p. 150.
PARES et LOZE. — La **reconstruction du centre ferroviaire** de Tours-Saint-Pierre-des-Corps. (5 000 mots & fig.)

**1948** — **625 .245 (44)**
Revue générale des chemins de fer, mai, p. 161.
ROUSSELET. — **Wagons à double plancher** pour le transport des fruits et légumes. (1 500 mots & fig.)

**1948** — **385 (44)**
Revue générale des chemins de fer, mai, p. 166.
**Organisation de la recherche scientifique** appliquée à la S.N.C.F. (Conférence de M. CHAN.) (8 000 mots & fig.)

**1948** — **385 .4 (42)**
Revue générale des chemins de fer, mai, p. 175.
**Organisation des transports britanniques nationalisés** à partir du 1er janvier 1948. (2 000 mots & carte.)

# In German.

## Glasers Annalen. (Berlin.)

**1948** — **621 .132 .3 (73)**
Glasers Annalen, Heft 5., Mai, S. 65.
WOLFF (A.). — Die **2D2 — Stromlinien — Schnellzuglokomotive,** Klasse J, der Norfolk & Western-Bahn, U.S.A. (4 500 Wörter, Tafeln & Abb.)

**1948** — **625 .2 (73)**
Glasers Annalen, Heft 5., Mai, S. 71.
HALLER (R.). — **Stromlinien- und Leichtbauzüge.** Neue Erkenntnisse in den U.S.A. (1 800 Wörter.)

**1948** — **621 .13 (09 (494)**
Glasers Annalen, Heft 5., Mai, S. 73.
BORN (E.). — **100 Jahre Schweizer Dampflokomotiven.** (3 000 Wörter & Tafeln.)

## Signal und Draht. (Frankfurt a./Mein.)

**1948** — **656 .25**
Signal und Draht, Nr. 3., S. 32; Nr. 4, S. 43.
LEINER (G.). — Über die **Unterhaltung der Stromversorgungsanlagen im Signal- und Fernmeldewesen.** (7 000 Wörter.)

**1948** — **656 .25**
Signal und Draht, Nr. 4., S. 37.
KRÄMER-NÜTTEL (W.). — **Streckensicherung im neuzeitlichen Signalbau.** (3 700 Wörter & Abb.)

**1948** — **656 .257 (494)**
Signal und Draht, Nr. 4., S. 46.
SASSE (H.). — Die neue **Signalisation** im Gotthardtunnel. (1 200 Wörter.)

# In English.

## Bulletin, American Railway Engineering Association. (Chicago.)

**1948** — **625 .14 (01 (73**
Bulletin, American Railway Engineering Association, No. 472, February, p. 416.
**Report of Committee 4. — Rail.**
JENSEN (R.S.). — **Sixth progress report of rolling-load tests of joint bars.** (10 pages, illustrated.)

**1948** — **625 .143 (01 (73)**
Bulletin, American Railway Engineering Association, No. 472, February, p. 437.
CRAMER (R.E.). — **Sixth progress report of the shelly rail studies at the University of Illinois.** (8 pages, illustrated.)

**1948** **625 .143 (01 (73)**
Bulletin, American Railway Engineering Association, No. 472, February, p. 446.
BLANK (H.A.) and MANNING (G.K.). — **Progress report on shelly rail studies.** (15 pages, illustrated.)

**1948** **625 .143 (73)**
Bulletin, American Railway Engineering Association, No. 472, February, p. 464.
**Effect of bolt spacing on rail web stresses within the rail joints.** (21 pages, illustrated.)

## The Engineer. (London.)

**1948** **656 .211 .7 (42)**
The Engineer, March 12, p. 250.
TRIPP (G.W.) — **Diesel electric paddle car ferry** « Forringford ». (2 000 words & fig.)

**1948** **625 .6 (42)**
The Engineer, March 12, p. 252.
**London Transport trolleybuses.** (1 000 words & fig.)

**1948** **691 (42)**
The Engineer, March 19, p. 277.
**A railway precast concrete depot.** (1 200 words & fig.)

**1948** **625 .144 .4 (42)**
The Engineer, March 26, p. 300.
**A railway track-laying machine.** (600 words & fig.)

## Engineering. (London.)

**1948** **625 .144 .4 (42)**
Engineering, No. 4283, Febr. 27, p. 211.
**Plant for laying pre-assembled track.** (600 words & fig.)

**1948** **625 .4 (42)**
Engineering, No. 4283, Febr. 27, p. 213.
**Automatic lifts on London Underground Railways.** (1 000 words & fig.)

**1948** **621 .132 .3 (42) & 621 .132 .5 (42)**
Engineering, No. 4286, March 19, p. 272.
**Locomotive valve gears and bearings**; British Railways (London Midland Region). (1 400 words & fig.)

**1948** **669**
Engineering, No. 4287, March 26, p. 289.
TABOR (D.). — **A theory of static and dynamic hardness.** (4 000 words & fig.)

**1948** **621 .132 .5 (42)**
Engineering, No. 4289, April 9, p. 344.
**2-6-0 freight locomotive:** London Midland Region. (1 000 words & fig.)

**1948** **621 .332 (42)**
Engineering, No. 4290, April 16, p. 368.
**High acceleration controller for electric traction.** (1 800 words & fig.)

## Journal of the Institution of Civil Engineer[s] (London.)

**1948** **625 .**
Journal of the Institution of Civil Engineers, Mar p. 14.
WALLACE (W.K.). — **Winter conditions and** Civil Engineer: **Railways.** (2 800 words.)

**1948** **62 (01 & 721**
Journal of the Institution of Civil Engineers, Ap p. 188.
SIDWELL (E.H.). — An investigation into strength of a **composite reinforced concrete floor.** (2 words & fig.)

**1948** **62 (**
Journal of the Institution of Civil Engineers, Ap p. 192.
SHU TAO CHEN. — Analysis of longitudinally sy**metrical Vierendeel girders.** (1 000 words & fig.)

**1948** **62 (01 & 721**
Journal of the Institution of Civil Engineers, Ap p. 194.
MARSHALL (W.T.). — **The lateral stability of re**[in]**forced concrete beams.** (2 400 words & fig.)

## The Locomotive. (London.)

**1948** **621 .131 .2 (4**
The Locomotive, May 15, p. 65.
**Locomotive design in relation to the power/wei**[ght] **ratio and others factors.** (500 words.)

**1948** **621 .132 .1 (4**
The Locomotive, May 15, p. 70.
MORRIS (O.J.). — **Standardising S.R. locomotiv**[es] **Central Section.** (To be continued.) (1 500 words, [ta]bles & fig.)

**1948** **621 .132 .1 (4**
The Locomotive, May 15, p. 79.
**British steam locomotives.** (600 words.)

**1948** **656 .2 (4**
The Locomotive, May 15, p. 80; June 15, p. 89.
**Some aspects of railway operation.** I. Effects of ci[vil] engineering factors. (To be continued.) (3 200 word[s]

## Mechanical Engineering. (New York.)

**1948** **621 .438 (7**
Mechanical Engineering, April, p. 301.
HOWARD (Alan). — Design features of a **4 800 H**[P] **locomotive gas-turbine power plant.** (2 600 words & fi[g.)]

**1948** **625 (7**
Mechanical Engineering, April, p. 321.
**Progress in railway mechanical engineering.** (3 words & fig.)

**1948** **669 .1**
Mechanical Engineering, May, p. 425.
WINSTON (A.W.) and BROOKS (M.E.). — **Magnesium castings** — Their production and use. (3 000 words & fig.)

**1948** **625 .216 (73)**
Mechanical Engineering, May, p. 454.
SPENCE (H.L.). — Association of American Railroads **standard car coupler.** (100 words & fig.)

**1948** **625 .2 (73)**
Mechanical Engineering, May, p. 457.
FELTON (S.M.). — **Opportunities in freight car design.** (100 words.)

## Modern Transport. (London.)

**1948** **621 .132 .1 (6)**
Modern Transport, March 13, p. 12.
**Metre-gauge locomotives** for Tanganyika. — A 2-8-2 convertible to 3 ft. 6 in. gauge. (700 words & fig.)

**1948** **621 .132 .3 (42)**
Modern Transport, March 13, p. 16; April 3, p. 18.
POULTNEY (E.C.). — **Landmarks of express locomotive progress.** — 9o Part 1. — Notable saturated steam units. Part II. — Raven three-cylinder engines. (2 200 words & fig.)

**1948** **385 (09 (42)**
Modern Transport, March 20, p. 3.
**Organisation under the Transport Commission.** (2 000 words & fig.)

**1948** **656 .2 (42)**
Modern Transport, March 20, p. 16.
WHITE (P.A.). — **Wagon turn-round time.** (1 200 words.)

**1948** **656 .25 (42)**
Modern Transport, March 27, p. 13.
**Railway signalling and telecommunications.** (500 words.)

**1948** **621 .431 .72 (42)**
Modern Transport, April 3, p. 7.
**Diesel shunting in factory sidings.** (600 words & fig.)

## Railway Age. (New York.)

**1948** **621 .431 .72 (73)**
Railway Age, April 3, p. 41.
**Diesels chief tool in road's improvement.** (1 800 words & fig.)

**1948** **385 (09 (52)**
Railway Age, April 17, p. 43.
HILL (H.G.). — **Japenese railways need new equipment.** (2 200 words & fig.)

**1948** **621 .431 .72 (73)**
Railway Age, April 24, p. 45.
**Alco's Diesel locomotive plant at Schenectady.** (200 words & fig.)

**1948** **656 .255 (44)**
Railway Age, April 24, p. 46.
LLOYD WILSON (G.). — **French railroads develop new freight-rate system.** (2 400 words.)

**1948** **625 .214 (73)**
Railway Age, April 24, p. 54.
SCHEY (R.). — **Hot boxes and train movement.** (1 200 words.)

## Railway Engineering and Maintenance. (Chicago.)

**1948** **625 .172 (73)**
Railway Engineering and Maintenance, May, p. 497.
**Tamps track with large crawler compressors.** (1 600 words & fig.)

**1948** **621 .133 .7 (73)**
Railway Engineering and Maintenance, May, p. 500.
DONAHUE (G.T.). — **Track pans need good drainage.** (1 200 words & fig.)

**1948** **721 .9 (73)**
Railway Engineering and Maintenance, May, p. 504.
BOASE (A.J.). — How to **get better concrete: Selection of materials.** (2 800 words & fig.)

## Railway Gazette. (London.)

**1948** **621 .431 .72 (42)**
Railway Gazette, No. 4, January 23, p. 114.
**Trial runs of main-line Diesel-electric locomotives.** (300 words & fig.)

**1948** **621 .33 (45)**
Railway Gazette, No. 5, January 30, p. 135.
PING (A.C.). — **Electrification of the Italian State Railways.** 3. (1 400 words & fig.)

**1948** **721 .5 (42) & 721 .9 (42)**
Railway Gazette, No. 5, January 30, p. 137.
London Midland Region engine shed **roofs in precast reinforced concrete.** (1 600 words & fig.)

**1948** **656 .285 (42)**
Railway Gazette, No. 5. January 30, p. 142.
**Ministry of Transport Accident Report.** Bridge Junction, Doncaster, L.N.E.R., August 9, 1947. (1 800 words & fig.)

**1948** **625 .13 (.494) & 656 .253 (.494)**
Railway Gazette, No. 6, February 6, p. 162.
FELBER (E.). — **Intermediate signalling in the St. Gotthard tunnel.** (1 400 words & fig.)

**1948** **621 .132 .1 (.6)**
Railway Gazette, No. 6, February 6, p. 165.
**New 2-8-2 locomotives for the Tanganyika Railway.** (800 words & fig.)

**1948** 621 .338 (.42) & 625 .174 (.42)
Railway Gazette, No. 6, February 6, p. 166.
**Ice removal on Tyneside electrified lines.** (400 words.)

**1948** 625 .61 (.42) & 656 .2 (.42)
Railway Gazette, No. 6, February 6, p. 170.
**Some features of co-ordinated working in transport.** (800 words.)

## Railway Mechanical Engineer. (New York.)

**1948** 621 .431 .72 (73)
Railway Mechanical Engineer, March, p. 61.
POMPA (L.). — Saving weight in a **Diesel's welded underframe.** (1 200 words & fig.)

**1948** 621 .438 (73)
Railway Mechanical Engineer, March, p. 64.
**The gas-turbine locomotive.** (1 600 words & fig.)

**1948** 625 .244 (73)
Railway Mechanical Engineer, March, p. 76.
S.L.R.X. plywood **refrigerator cars.** (1 500 words & fig.)

**1948** 625 .25 (73)
Railway Mechanical Engineer, March, p. 96.
HINES (C.M.). — Checker for **high-speed brakes.** (1 600 words & fig.)

# In Danish. (= 439.81.)

## Ingeniøren. (Copenhagen.)

**1948** 621 .33 (493) = 439 .81
Ingeniøren, No 19, May, p. 278.
BENTDSEN (P.). — **Electrification** scheme of the Belgian Railways. (2 400 words & fig.)

## Sikringsteknikeren. (Copenhagen.)

**1948** 656 .253 (73) = 439 .81
Sikringsteknikeren, No. 4, May, p. 309.
FORCHHAMMER (N.). — **Railway signalling systems** of the United States. (1 600 words.)

**1948** 656 .25 (489) = 439 .81
Sikringsteknikeren, No. 4, May, p. 315.
HANSEN (W.). — **Control indicator versus speed indicator.** (600 words & fig.)

# In Spanish.

## Boletin de Obras Publicas. (Quito-Ecuador.)

**1947/48** 385 (09 (86)
Boletin de Obras Publicas, nº 63-65, p. 60.
**Datos historicos sobre los Ferrocarriles Ecuatorianos.** (7 000 palabras & fig.)

## Ferroviarios. (Madrid.)

**1948** 625 .617 (44 + 460)
Ferroviarios, mayo, p. 3.
**Vagones de ejes intercambiables.** (1 000 palabras & fig.)

## Revista de Obras Públicas. (Madrid.)

**1948** 62. (01
Revista de Obras publicas, marzo, p. 115; abril, p. 158.
de CASTRO CUBELLS (V.). — Metodo Roentgenografico para la **medida de tensiones.** (5 500 palabras & fig.)

**1948** 691 & 721 .9
Revista de Obras publicas, mayo, p. 200.
SOTO BURGOS (J.) & ORTUNO MEDINA (C.). — Abacos para el **calculo rapido de secciones de hormigon armado** solicitadas a flexion simple. (1 400 palabras & fig.)

# In Italian.

## Giornale del Genio Civile. (Roma.)

**1947** 624 .2
Giornale del Genio civile, novembre-dicembre, p. 475.
POZZATI (P.). — La **trave Vierendeel** in varie condizioni di vincolo. (3 000 parole & fig.)

**1947** 62. (01 & 721 .9
Giornale del Genio civile, novembre-dicembre, p. 481.
SCANO (F.). — Calcolo diretto delle **sezioni di cemento armato** simmetriche di forma qualunque ed a T sollecitate a flessione simplice retta. (2 000 parole & fig.)

**1948** 62. (01 & 691
Giornale del Genio civile, gennaio, p. 3.
CAVALLARI-MURAT (A.) & DE BERNOCHI (C.). — **I raggi X. e le costruzioni in cemento armato.** (8 000 parole & fig.)

**1948** 62. (01
Giornale del Genio civile, gennaio, p. 18.
POZZATI (P.). — Sul **calcolo delle lastre rettangolari** continue. (3 000 parole & fig.)

## L'Ingegnere. (Milano.)

**1948** 62. (01 & 721 .9
L'Ingegnere, gennaio, p. 13.
SANTARELLA (M. G. Mattiazzo). — Tabella e diagrammi unificati per **sezioni rettangolari in cemento armato a flessione semplice e composta.** (2 000 parole, tabella & fig.)

**1948** 624 .1 (.45) & 721 .1 (.45)
L'Ingegnere, gennaio, p. 25.
SANSONI (R.). — **Fondazioni su pali trivellati.** (1 500 parole & fig.)

**1948** **625 .13**

L'Ingegnere, febbraio, p. 95.

COLLURA (P.). — Note sulla **stabilità dei sotterranei** larghi con pilastri e sulle cause dei crolli. (3 500 parole & fig.)

**1948** **621 .431 & 621 .89**

L'Ingegnere, febbraio, p. 118.

FAVRETTI (M.). — Studio sulla **lubrificazione della coppia cinematica pistone-cilindro** di un motore a combustione interna. (2 000 parole & fig.)

## In Polish (= 91.885)

### Przeglad Komunikacyjny. (Warsaw.)

**1948** **656 .25 = 91 .885**

Przeglad Komunikacyjny, No. 2, p. 62.

BARYSZ (E.). — **Security degree of train movement** on lines as a function of technical installations. (5 500 words.)

**1948** **656 .222 .6 = 91 .885**

Przeglad Komunikacyjny, No. 2, p. 79.

KACZMARKIEWICZ (B.). — **Planning of freight traffic.** (5 000 words.)

**1948** **656 .2 = 91 .885**

Przeglad Komunikacyjny, No. 2, p. 82.

LELITO (J.). — **The task and duties of the commercial department** in the present economic structure. (8 000 words.)

**1948** **385. (09 (.47) = 91 .885**

Przeglad Komunikacyjny, No. 2, p. 91.

OBRAZCOW (W.). — **Technical progress** of the railways in U.R.S.S. (2 000 words.)

## In Swedish. (= 439.71)

### Statsbane-Ingenjören. (Stockholm.)

**1948** **621 .431 .72 (42) = 439 .71**

Statsbane-Ingenjören, No. 1, February, p. 1.

NILSSON (K.) & TRANG (K.-H.). — **Diesel electric shunting locomotives** in England. (3 500 words.)

**1948** **656 .281 (485) = 439 .71**

Statsbane-Ingenjören, No. 1, February, p. 11.

BYLUND (A.). — **Lifting of a D locomotive derailed** on a turntable. (800 words.)

**1948** **625 .151 = 439 .71**

Statsbane-Ingenjören, No. 1, February, p. 15.

**Maintenance of railway crossings.** (900 words.)

**1948** **625 .1 (494) = 439 .71**

Statsbane-Ingenjören, No. 2, March, p. 37.

ANDREAE (C.). — Hundred years of **railway construction in Switzerland.** (3 900 words & fig.)

**1948** **621 .133 .1 (42) = 439 .71**

Statsbane-Ingenjören, No. 2, March, p. 48.

NILSSON (K.) & TRANG (K.-H.). — **Oil burning steam locomotives** of the Great Western Railway. (700 words & fig.)

**1948** **656 .28 = 439 .71**

Statsbane-Ingenjören, No. 2, March, p. 51.

BUTEN (H.). — An instructive **accident.** (900 words & fig.)

### Teknisk Tidskrift. (Stockholm.)

**1948** **656 .485) = 439 .71**

Teknisk Tidskrift, No. 22, May, p. 353.

ASTRÖM (T.). — **Railway communications in Sweden.** (3 000 words.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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## I. — BOOKS.

### In French.

1948 — 625 .13

ANDRAE (Ch.).

**Les grands souterrains transalpins.**

Zürich, S. A. Leemann Frères & Co., éditeurs. 1 volume 8° de 200 pages et 69 figures. (Prix : broché, 22 fr. suisses.)

1947 — 385 (02

BOHL (G.).

**Aide-mémoire Dunod : Chemins de fer.**

Paris, Dunod, éditeur, 92, rue Bonaparte. 1 volume (10×15 cm.) de XVI - XLVIII - 412 pages, avec 102 figures, 70 tableaux et 4 planches. 61e édition. (Prix : relié simili-cuir, 290 fr. français.)

1948 — 625 .113

GAUNIN (J.).

**Tables pour le tracé des courbes de Chemins de fer, Routes et Canaux.** Nouveau tirage.

Paris, Dunod, éditeur. 1 volume (13,5×21 cm.) de XLVII+182 pages.

1948 — 621 .9

MAILLOT (L.).

**Le Manuel du Mécanicien.** 4e édition.

Paris, Dunod, éditeur, 92, rue Bonaparte. 1 volume (13×21 cm.) de VI - 199 pages et 117 figures. (Prix : broché, 240 fr. français.)

1948 — 691

RITTER (Dr M.) et LARDY (Dr P.)

**Le béton précontraint.** Théories, calculs, essais et réalisations suisses. Traduit de l'allemand par J. DELARUE.

Paris, Dunod, éditeur. 1 volume (16×25 cm.) de VI - 38 pages, avec 65 figures. (Prix : 380 fr. français.)

### In German.

1948 — 691

Dr-Ing. SALIGER (R.).

**Die neue Theorie des Stahlbetons.** 2. Ausgabe.

Wien I, Verlag von Franz Deuticke, Helferstorferstrasse, 4. 110 Seiten, 56 Abb. im Text. (Preis : 13 Schweiz. Fr.)

### In English.

1948 — 656 .25 (73)

ASSOCIATION OF AMERICAN RAILROADS. **Signal Section.**

Vol. XLV, No. 1. — Reports to be presented at the Fiftieth Annual Meeting, Buffalo. N. Y., September 14, 15 and 16, 1948.

New York 7, N. Y. : Association of American Railroads, Signal Section, Publishers.

1948 — 313 .385 (42)

BRITISH TRANSPORT COMMISSION : **Transport Statistics.** 1948.

No. 1. Period to 25 January. — No. 2. Period to 22 February. — No. 4. Period to 18 April. — No. 5. Period to 16 May.

London : British Transport Commission. (Price : 1s. each. number.)

1948 — 621 .134 .2

GREENLY (H.).

**Walschaerts' valve gear.**

Revised by STEEL (E. A.).

London : Percival Marshall and Company, Limited, 23, Great Queen Street, Kingsway. W. C. 2. (Price : 3s. net.)

1948 — 385 (09 (41)

Mc CORMICK (W. P.).

**Main Line Railways of Northern Ireland.**

Published by the author. Belfast : « Islandvale », 19, King's Road, Knock. (8 1/4×5 1/2 in.), 47 pages. Illustrated. Paper covers. (Price : 2s.6d. net.)

1947 — 385 (061

**Proceedings of the International Railwaymen's Conference, held from 25th to 28th March 1947 in Brussels.**

London : 1947. International Transport Worker's Federation, Maritime House, Old Town, Clapham, S. W. 4.

1948 — 656 .23 (73)

WILSON (G. L.).

**New departures in freight rate making.**

New York, U.S.A. : Simmons-Boardman Publishing Corporation, 30, Church Street. One volume (9 1/4×6 1/4 in.), 150 pages. (Price : $ 3.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

[ 016. 385. (05 ]

## II. — PERIODICALS.

### In French.

#### Bulletin de la Société des Ingénieurs civils de France. (Paris.)

**1947** 698

Bulletin de la Soc. des Ing. civils de France (mémoires), fasc. nº 7-8, juillet-août, p. 432.

CHAMPETIER. — Les **nouveaux constituants des peintures.** (10 000 mots & fig.)

**1947** 625 .24 (44) & 625 .26 (44)

Bulletin de la Soc. des Ing. civils de France (mémoires), fasc. nº 7-8, juillet-août, p. 450.

MASSERAN. — Le **montage à la chaîne des wagons couverts** au moyen d'éléments préfabriqués aux U.S.A. (7 000 mots & fig.)

#### Bulletin technique de la Suisse romande. (Lausanne.)

**1948** 691

Bulletin technique de la Suisse romande, 22 mai, p. 137.

BOLOMEY (J.). — Granulation continue ou discontinue des **bétons.** (1 500 mots & fig.)

**1948** 625 .23 (494)

Bulletin technique de la Suisse romande, 5 juin, p. 156.

Les Chemins de fer fédéraux s'efforcent d'accroître leur **parc de voitures.** (600 mots.)

#### Bulletin des C.F.F. (Berne.)

**1948** 625 .212

Bulletin des C.F.F., mai, p. 73.

GUIGNARD (R.). — **Véhicules ferroviaires montés sur pneumatiques.** (1 500 mots & fig.)

**1948** 621 .33 (481)

Bulletin des C.F.F., mai, p. 77.

PASYKOWSKI (F.). — **L'électrification** en Norvège. (1 100 mots & fig.)

#### Génie Civil. (Paris.)

**1948** 691

Génie Civil, nº 3231, 15 juin, p. 226.

AMMANN (A.) et BOYRIE (P.). — Le **béton aéré.** (3 500 mots, tableaux & fig.)

**1948** 62. (01

Génie Civil, nº 3231, 15 juin, p. 230.

FERRANDON (J.). — **L'état d'équilibre limite des massifs filtrants.** (1 200 mots & fig.)

**1948** 621 .8

Génie Civil, nº 3232, 1er juillet, p. 251.

Le **palier flottant.** (1 500 mots & fig.)

**1948** 624 .8 (44

Génie Civil, nº 3232, 1er juillet, p. 253.

La **reconstruction du pont de Kehl** sur le Rhin. (1 00 mots & fig.)

#### L'Industrie des voies ferrées et des transports automobiles. (Paris.)

**1948** 625 .23

L'Industrie des Voies ferr. et Transp. automob., janvier p. 218; février, p. 227.

JOUR (R.). — **Les tubes fluorescents et leur utilisatio pour l'éclairage des véhicules** de transport en commun (7 000 mots, tableaux & fig.)

**1948** 621 .431 .72 & 625 .61

L'Industrie des Voies ferr. et Transp. automob., mars p. 240.

GUICHETEAU. — La **modernisation des chemins d fer secondaires par la traction Diesel.** (1 000 mots & fig.)

**1948** 625 .62 (.493

L'Industrie des Voies ferr. et Transp. automob., mars p. 242.

ALBERT. — Renseignements généraux concernant le **lignes de contact pour tramways et trolleybus** des Réseau belges. (2 000 mots et tableaux.)

#### Organisation scientifique. (Bruxelles.)

**1948** 385 .587 (.493) & 625 .24 (.493

Organisation scientifique, mars, p. 129.

DE LOOF (W.). — Le **montage à la chaîne de wagon de chemins de fer.** (5 000 mots & fig.)

**1948** 385 .587 (493) & 655 (493

Organisation scientifique, avril, p. 176.

VERMEULEN (R.). — Comment suivre l'exécutio d'un nombre important de commandes? La méthode appliquée par l'**Imprimerie de la S.N.C.B.** (3 000 mots & fig.)

#### L'Ossature métallique. (Bruxelles.)

**1948** 624 .9

L'Ossature métallique, mars, p. 111.

LAUREYSSENS (H.). — Nouvelles formes dans l construction des **charpentes métalliques.** (800 mots & fig.)

**1948** 621 .39

L'Ossature métallique, mars, p. 115.

Les **éléments de machines en tôles soudées.** (4 000 mot & fig.)

**1948** **621 .392 & 721**
L'Ossature métallique, mars, p. 139.
ALEXANDRE (R.). — L'emploi de la **soudure à l'arc** dans la construction économique des bâtiments. (7 000 mots & fig.)

---

**1948** **693**
L'Ossature métallique, avril, p. 190.
BALBACHEVSKY (G. N.). — La **protection des constructions métalliques contre le feu.** (3 000 mots, tableaux & fig.)

---

**1948** **624 .2**
L'Ossature métallique, avril, p. 200.
DORLET (E.). — Calcul par tableaux des joints d'âme des **poutres rivées** soumises à flexion. (1 500 mots, tabl. & fig.)

---

## Rail et Route. (Paris.)

**1947** **621 .132 .3 (.44) & 621 .132 .5 (.44)**
Rail et Route, décembre, p. 1.
La **locomotive à vapeur 141 P.** (2 000 mots & fig.)

---

**1947** **385. (09 (.69)**
Rail et Route, décembre, p. 9.
GOUDARD (J.). — Les **Chemins de fer de Madagascar.** (3 000 mots & fig.)

---

**1948** **621 .431 .72 (.73)**
Rail et Route, janvier-février, p. 1; mars, p. 2.
La **traction Diesel** aux Etats-Unis. (4 500 mots & fig.)

---

**1948** **656 .222 .5**
Rail et Route, janvier-février, p. 8.
LEPINE (P.). — Le **problème des horaires.** (2 500 mots & fig.)

---

**1948** **621 .335 (.44)**
Rail et Route, mars, p. 1.
La **locomotive électrique 2 D 2.** (2 000 mots.)

---

**1948** **625 .23 (.44)**
Rail et Route, mars, p. 11.
Les **rames légères** Michelin. (700 mots & fig.)

---

## Revue de l'Aluminium. (Paris.)

**1948** **621 .332, 625 .62 & 669**
Revue de l'Aluminium, janvier, p. 3.
ALBERT (L.). — Les **métaux de remplacement du cuivre dans la construction des lignes de contact** pour tramways et trolleybus. (5 000 mots, tableaux & fig.)

---

**1948** **669 .71**
Revue de l'Aluminium, février, p. 37; avril, p. 113.
CHARTRON (M.). —**La déformation à chaud des métaux** à la presse et au marteau-pilon. — I. Forgeage de l'aluminium et de ses alliages. — II. Les lois de l'écrasement. Applications et Conclusions. (10 000 mots & fig.)

## Revue de l'Association française des Amis des Chemins de fer. (Paris.)

**1948** **621 .33**
Revue de l'Assoc. franç. des Amis des Ch. de fer, mars-avril, p. 25.
GACHE (A.) et CAIRE (D.). — Parlons de la **traction par courant alternatif monophasé à 50 périodes.** (1 800 mots & fig.)

---

**1948** **621 .335 (44)**
Revue de l'Assoc. franç. des Amis des Ch. de fer, mars-avril, p. 27.
CAIRE (D.). — La **locomotive électrique C.C. 1 500 volts** à grande vitesse étudiée par la Société Alsthom. (2 000 mots & fig.)

---

**1948** **621 .131 .2 (44)**
Revue de l'Assoc. franç. des Amis des Ch. de fer, mars-avril, p. 35.
CHAN (G.). et CAIRE (D.). — Que serait une **locomotive de vitesse** conçue suivant la technique de la 141-R? (3 000 mots & fig.)

---

**1948** **621 .335 (44)**
Revue de l'Assoc. franç. des Amis des Ch. de fer, mars-avril, p. 39.
GACHE (A.). — Les **locomotives 2' $D_0$ 2' lourdes à grande vitesse,** en construction au Groupement C.E.M. Fives-Lille pour la ligne électrifiée Paris—Lyon. (1 100 mots & fig.)

---

**1948** **621 .335 (44)**
Revue de l'Assoc. franç. des Amis des Ch. de fer, mars-avril, p. 42; mai-juin, p. 65.
GACHE (A.). — Le **parc actuel de matériel roulant électrique** de la S.N.C.F. (1 600 mots & fig.)

---

## Revue générale des chemins de fer. (Paris.)

**1948** **621 .333**
Revue générale des chemins de fer, juillet, p. 221.
GARREAU et NOUVION. — Considérations sur les **moteurs de traction monophasés du type série à collecteur.** (8 000 mots, tableaux & fig.)

---

**1948** **621 .431 .72 (44)**
Revue générale des chemins de fer, juillet, p. 236.
CANTAT. — **Un autorail pour lignes à faible trafic.** Les matériels prototypes mis en service en 1947. (2 500 mots & fig.)

---

**1948** **624 .63 (44)**
Revue générale des chemins de fer, juillet, p. 242.
JOUANNEAU. — **Reconstruction du pont** sur la Loire à Orléans. (3 000 mots & fig.)

---

## La Technique moderne. (Paris.)

**1948** **621 .436**
La Technique moderne, 1er et 15 janvier, p. 10.
DELASTRE (J.). — **Transmission électrique de la puissance d'un moteur Diesel.** (4 000 mots, tableaux & fig.)

1948 62. (01
La Technique moderne, 1er et 15 février, p. 41.
BERRY (M.). — Les **extensomètres** à **fil** **résistant.** (7 000 mots & fig.)

1948 669 .1
La Technique moderne, 1er et 15 février, p. 52.
Le **travers de l'acier.** (4 500 mots & fig.)

## In German.

### Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik. (Zürich.)

1948 656 .234 (494)
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr. 2, S. 117.
FISCHER (W.). — Die **Neugestaltung der Personentarife** der Schweizerischen Bundesbahnen. (12 000 Wörter & Tabellen.)

1948 385 .14 (494)
Schweizerisches Archiv für Verkehrswissenschaft und Verkehrspolitik, Nr. 2, S. 148.
WICK (J.). — Zum neuen **Bundesgesetz über den Transport auf Eisenbahnen und Schiffen.** (10 000 Wörter.)

### Signal und Draht. (Frankfurt-a.-M.)

1948 656 .257
Signal und Draht, Nr. 5, S. 49.
SPRÖGGEL (R.). — Musterentwürfe für **Stellwerkhochbauten.** (4 500 Wörter & Abb.)

1948 656 .211 .5 (42)
Signal und Draht, Nr. 5, S. 56.
HOHLWEIN (W.). — **Eisenbahnlautsprecheranlagen** in England. (4 500 Wörter.)

## In English.

### The Engineer. (London.)

1948 621 .131 .2 (42)
The Engineer, April 23, p. 394.
**L.M.S. mobile locomotive testing plant.** (1 800 words.)

1948 621 .131 .2 (42)
The Engineer, April 23, p. 409; April 30, p. 434.
ANDREWS (H. L.). — **The mobile locomotive testing plant** of the London Midland and Scottish Railways (to be continued). (3 800 words & fig.)

1948 621 .32 (42) & 656 .212 (42)
The Engineer, April 30, p. 431.
**Lighting at King's Cross goods yard.** (400 words & fig.)

1948 621 .39
The Engineer, April 30, p. 432.
**Developments in cold welding.** (800 words & fig.)

### Engineering (London.)

1948 621 .94 (42
Engineering, No. 4291, April 23, p. 392.
**Grinding dovetail slideways of machine tools.** (40 words & fig.)

1948 621 .431 .72 (42
Engineering, No. 4291, April 23, p. 393.
**204 H.P. Diesel locomotive.** (200 words.)

1948 62 (0
Engineering, No. 4292, April 30, p. 409.
LAUGHARNE THORTON (D.). — **Impact loading** o **structures.** (4 600 words & fig.)

1948 621 .431 .72 (42
Engineering, No. 4292, April 30, p. 416.
**Diesel-electric shunting locomotive.** (1 400 words & fig.

1948 621 .94 (42
Engineering, No. 4292, April 30, p. 417.
**Automatic internal-grinding machine.** (600 words & fig.

1948 62 (01 & 66
Engineering, Nr. 4293, May 7, p. 433.
HAMILTON (A. M.). — **Bolted connections in structures.** (2 400 words & fig.)

### Journal and Proceedings, Institution of Mechanical Engineers. (London.

1947 656 .212 .
Proceedings, Institution of Mechanical Engineers, Volume 157, War Emergency Issue No. 32, p. 306.
BROUGHTON (H. H.). — **Electric cranes and hoist** (2 600 words.)

1947 69
Proceedings, Institution of Mechanical Engineers, Volume 157, War Emergency Issue No. 33, p. 355.
FABER (O.). — **Heating, ventilation and conditioning** (3 000 words.)

1947 625 .24
Proceedings, Institution of Mechanical Engineers, Volume 157, War Emergency Issue No. 33, p. 361.
DOREY (S. F.). — **Refrigeration. — The present position and trends.** (2 400 words.)

### The Locomotive. (London.)

1948 621 .132 .3 (73
The Locomotive, June 15, p. 84.
POULTNEY (E. C.). — **Chesapeake & Ohio Railwa 4-6-4 passenger locomotives.** (1 000 words & fig.)

1948 621 .132 .3 (44) & 621 .132 .5 (44
The Locomotive, June 15, p. 85.
**Re-built 4-8-4 and 2-12-0 locos.** French National Railways. (1 000 words & fig.)

1948 621 .335 (44)
The Locomotive, June 15, p. 87.
**Heavy electric shunting locos for France.** (1 000 words & fig.)

## Mechanical Engineering. (New York.)

1948 669
Mechanical Engineering, June, p. 505.
GAUTHIER (I. R.) and ROWE (H. J.). — **Engineering for aluminium-alloy castings.** (6 000 words & fig.)

1948 621 .438
Mechanical Engineering, June, p. 515.
FUSNER (G. R.). — The **gas turbine with a waste-heat boiler.** (2 400 words & fig.)

1948 385 (09 (68)
Mechanical Engineering, June, p. 523.
LOUBSER (M. M.). — The **South African Railways** (3 200 words & fig.)

## Modern Transport. (London.)

1948 625 .173 (42)
Modern Transport, April 10, p. 3.
**Novel track renewal.** Preassembled method in tunnel. (1 000 words & fig.)

1948 625 .4 (44)
Modern Transport, April 10, p. 13; June 12, p. 9.
**Paris Metropolitain developments.** — I. New rolling stock proposals. — II. An all-relay signalbox. (1 800 words & fig.)

1948 621 .431 .72 (42)
Modern Transport, April 17, p. 15.
**Light Diesel shunting.** (400 words & fig.)

1948 625 .232 (42)
Modern Transport, April 24, p. 3.
**Double-deck railway carriages.** Analysis of existing designs. (500 words & fig.)

1948 621 .131 .3 (42)
Modern Transport, April 24, p. 12.
**Locomotive trials on British Railways.** (1 000 words & tables.)

1948 656 .215 (42)
Modern Transport, May 1, p. 3.
**Railway yard lighting.** (600 words & fig.)

1948 656 .234 (71) & 656 .257 (71)
Modern Transport, May 1, p. 12.
**C.P.R. ticket machine.** (300 words & fig.)

1948 621 .132 .5 (41)
Modern Transport, May 1, p. 14.
**New G.N.R. (I.) locomotives.** (400 words & fig.)

1948 693 (42)
Modern Transport, May 1, p. 17.
**Fire protection for freight terminals.** (400 words & fig.)

1948 656 .257 (42)
Modern Transport, May 8, p. 7.
**Railway parcel stamps.** (300 words & fig.)

1948 656 .254 (42)
Modern Transport, May 8, p. 9.
**Teleprinters in railway service.** I.R.S.E. discussion on L.N.E.R. installation. (300 words & fig.)

## Railway Age. (New York.)

1948 656 .254 (73)
Railway Age, May 1, p. 48.
**Radio expedites switcher service.** (1 200 words & fig.)

1948 621 .431 .72 (73)
Railway Age, May 8, p. 34.
**Pennsylvania 6 000 H.P. freight diesels.** (3 000 words & fig.)

1948 621 .39 (73) & 625 .233 (73)
Railway Age, May 8, p. 47.
**Power networks for passenger trains.** (1 200 words & fig.)

1948 625 .142 (0 (73)
Railway Age, May 8, p. 53.
**Seek to broaden the benefits of timber treatment.** (2 400 words.)

1948 625 .28 (73)
Railway Age, May 15, p. 180.
**Motive power use is undergoing refinement.** (1 900 words, tables & fig.)

1948 625 .151 (73) & 669 .1 (73)
Railway Age, May 22, p. 40.
**Heat treating special trackwork** at Bethlehem's Steelton plant. (300 words & fig.)

## Railway Engineering and Maintenance. (Chicago.)

1948 625 .111 (73)
Railway Engineering and Maintenance, June, p. 592.
**Burlington maps roadbed conditions with power augers.**

1948 625 .143 .2 (73)
Railway Engineering and Maintenance, June, p. 596.
**Heat treating special trackwork at the mill.** (1 200 words & fig.)

1948 721 .9 (73)
Railway Engineering and Maintenance, June, p. 603; July, p. 712.
BOASE (A. J.). — How to get better concrete. — Proportioning the mix. — Manufacturing procedure. (3 600 words & fig.)

1948 625 .142 .4 (42)
Railway Engineering and Maintenance, June, p. 607.
MILMOYLE (R. L.). — **British test prestressed concrete crossties.** (1 200 words & fig.)

## Railway Gazette. (London.)

**1948** **625 .13 (.493)**
Railway Gazette, No. 7, February 13, p. 187.
**The Brussels Junction Railway.** (900 words, fig. & maps.)

**1948** **625 .143 .5 (.42)**
Railway Gazette, No. 7, February 13, p. 191.
**Spring-steel rail spikes.** (1 200 words & fig.)

**1948** **621 .94 (.42)**
Railway Gazette, No. 7, February 13, p. 194.
**New precision crankpin grinder.** (400 words & fig.)

**1948** **621 .132 .1 (.42)**
Railway Gazette, No. 7, February 13, p. 215.
**London Midland Region locomotive developments.** (1 800 words & fig.)

**1948** **656 .211 .5 (.42)**
Railway Gazette, No. 7, February 13, p. 220.
**Developments in booking office design.** (900 words & fig.)

**1948** **385 (072 (.42)**
Railway Gazette, No. 7, February 13, p. 222.
A railway scientific research organisation. (2 200 words & fig.)

**1948** **621 .131 .2 (42)**
Railway Gazette, No. 9, February 27, p. 246.
**Steel castings for locomotive parts.** (200 words.)

**1948** **621 .33**
Railway Gazette, No. 9, February 27, p. 247.
HAWLEY (W. G.) and KITCHIN (F. B.). — **Surge protection by means of capacitors.** (1 200 words & fig.)

**1948** **621 .138 .3 (73)**
Railway Gazette, No. 9, February 27, p. 250.
**A service station for steam locomotives.** (1 200 words & fig.)

**1948** **621. 231 (54)**
Railway Gazette, No. 9, February 27, p. 252.
WATNEY (N. C.). — **Rehabilitated passenger coaches** for the North Western Railway, India. (1 400 words & fig.)

**1948** **385 .517 .6 (44)**
Railway Gazette, No. 9, February 27, p. 254.
**Protecting ticket clerks against infection.** (200 words & fig.)

## Railway Mechanical Engineer. (New York.)

**1948** **621 .133 .3 (73)**
Railway Mechanical Engineer, April, p. 65.
HUSTON (F. P.). — Design and construction of **stay-bolted fireboxes.** (2 800 words & fig.)

**1948** **625 .243 (73)**
Railway Mechanical Engineer, April, p. 72.
BORUCKI (R. B.) and SIPP (E. A.). — **Aluminum freight-car** construction. (2 000 words & fig.)

**1948** **625 .25 (73**
Railway Mechanical Engineer, April, p. 78.
SUDDUTH (H. W.). — Fundamentals of No. 6-B **brake equipment.** (500 words & fig.)

**1948** **621 .133 .3 (73**
Railway Mechanical Engineer, April, p. 79.
Research Institute develops a **high-pressure boiler** (50 words & fig.)

# In Spanish.

## Ferrocarriles y Tranvias. (Madrid.)

**1948** **621 .3**
Ferrocarriles y Tranvias, marzo, p. 97.
MANTERO (S.). — **Alumbrado fluorescente en e ferrocarril.** (1 500 palabras & fig.)

**1948** **625 .142 .**
Ferrocarriles y Tranvias, marzo, p. 113.
ESCRIBA (N.). — **Traviesa de hormigón armado.** (80 palabras & fig.)

**1948** **656 .2**
Ferrocarriles y Tranvias, abril, p. 137; mayo, p. 184.
CASTILLO LATORRE (E.). — Tipos y funcionamient de los **relés** empleados en las instalaciones de señalizació y enclavamientos eléctricos (continua). (4 500 palabra & fig.)

**1948** **621 .133 .1 (460**
Ferrocarriles y Tranvias, abril, p. 142.
ASIN (F. Pedrero). — **Ecónomia de carbón** mediant la instalación de estaciones mezcladores de menudos (1 600 palabras.)

**1948** **625 .28 (460**
Ferrocarriles y Tranvias, abril, p. 154.
VILLAR (M.). — El momento actual de los ferro carriles españoles en lo que afecta a **material móvil.** (2 50 palabras.)

**1948** **625 .17 (44**
Ferrocarriles y Tranvias, mayo, p. 194.
CAMBOURNAC (L.). — Métodos de **conservación d la via** en Francia. (8 000 palabras.)

# In Italian.

## Alluminio. (Milano.)

**1947** **66**
Alluminio, luglio-agosto, p. 284.
HUGONY (E.). — La pratica del controllo statistic della qualità in **metallurgia.** (4 500 parole & fig.)

**1947** **625 .242 (.73**
Alluminio, settembre-ottobre, p. 416.
**Alleggerimento dei carri-merci.** (250 parole & fig.)

**1947** **62. (01 & 669 .71**
Alluminio, novembre-dicembre, p. 495.
BORDONI (P. G.). — Studio delle **proprietà elastiche dell' alluminio** con un metodo ellettroacustico. (4 000 parole, tabelle & fig.)

## Ingegneria ferroviaria. (Roma.)

**1948** **625 .13 (44 + 45)**
Ingegneria ferroviaria, maggio, p. 269.
SAVOJA (A.). — **Il traffico attraverso il valico del Cenisio.** (8 000 parole & tavola.)

**1948** **625 .1 (45)**
Ingegneria ferroviaria, maggio, p. 281.
FRANZI (C.). — La **ricostruzione** nel Compartimento F.S. di **Roma.** (5 000 parole, tavole & fig.)

**1948** **656 .212 .5**
Ingegneria ferroviaria, maggio, p. 289.
GUZZANTI (C.). — Frenatura concentrata o ripetuta nelle **stazioni di smistamento a gravità?** (2 500 parole & fig.)

## Trasporti pubblici. (Roma.)

**1947** **656 (45)**
Trasporti Pubblici, novembre-dicembre, p. 1241.
DELL' ARCIPRETE (E.). — **Ferrovie in concessione ed autolinee.** (1 800 parole & fig.).

**1948** **385 .114 & 656**
Trasporti Pubblici, gennaio-febbraio, p. 5.
MARESCA (G.). — **Influenza della pendenza sul costo sui limiti economici di impiego dei diversi mezzi di trasporto.** (10 000 parole & fig.)

**1948** **656 .234 (45)**
Trasporti Pubblici, gennaio-febbraio, p. 25.
GUZZANTI (C.). — Alcune considerazioni sui **trasporti terrestri per viaggiatori.** (8 000 parole & tavole.)

# In Dutch.

## Spoor- en Tramwegen. (Utrecht.)

**1948** **656 .223 .2**
Spoor- en Tramwegen, Nr 13, 17 Juni, p. 197.
BLOEMERS (G. F.). — Het « **losse laadvloerensysteem** ». (1 000 woorden & fig.)

**1948** **624 .32 (492)**
Spoor- en Tramwegen, Nr 13, 17 Juni, p. 199; Nr 14, 1 Juli, p. 210.
SORBER (J. H. C.). — De **spoorbrug over de Maas** bij Ravenstein in en na de oorlog. Vernieling, tijdelijke en definitieve herstelling van onder- en bovenbouw. (6 000 woorden & fig.)

**1948** **625 .2 : 625 .62 (492)**
Spoor- en Tramwegen, Nr 14, 1 Juli, p. 215.
Een **nieuwe serie motorrijtuigen** van de H.T.M. (2 200 woorden & fig.)

**1948** **621 .33**
Spoor- en Tramwegen, Nr 14, 1 Juli, p. 220.
Het **motorcontroller-systeem** van Smit-Slikkerveer voor electrische treinen. (800 woorden & fig.)

# In Polish. (= 91 .885)

## Przeglad Komunikacyjny. (Warsaw.)

**1948** **385 (09 .2 (438) = 91 .885**
Przeglad Komunikacyjny, nº 3, p. 109.
Aleksander WASINTYNSKI (1859-1944). — **His life and his works.** (3 500 words & portrait.)

**1948** **656 .212 .5 = 91 .885**
Przeglad Komunikacyjny, nº 3, p. 115.
CZEKAJEWSKA (H.). — Impulsive wedge as auxiliary means in **sorting the waggons.** (3 000 words & fig.)

**1948** **621 .135 .4 = 91 .885**
Przeglad Komunikacyjny, nº 3, p. 120; nº 4, p. 171.
LANGROD (A.). — The **running of railway vehicles through curves.** (3 500 words & fig.)

**1948** **656 .253 = 91 .885**
Przeglad Komunikacyjny, nº 4, p. 161.
BARYSZ (E.). — **Safety systems of train movement installations in the stations** according to trafic requirements. (5 000 words.)

**1948** **656 .225 (438) = 91 .885 & 656 .261 (438) = 91 .885**
Przeglad Komunikacyjny, nº 4, p. 187.
DOBIECKI (A.) and BISSAGA (T.). — Necessity to a large scale use of **containers** on the Polish Railways. (15 000 words.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS (1)

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## I. — BOOKS.

### In French.

**1948** 385 (44)
**L'Année ferroviaire 1948.**
Paris, Librairie Plon, 8, rue Garancière. 1 volume de 282 pages, figures et tableaux.

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**1948** 625 .113
**GAUNIN (J.), BERNARD (A.) et HOUDAILLE (L.).**
**Tables pour le tracé des courbes de chemins de fer, routes et canaux.**
Paris, Dunod, éditeur, 1 volume (14×22 cm.) de LXII + 366 pages avec 21 figures. (Prix : 760 fr. français.)

---

**1948** 669
**GUILLET (L.).**
**Structures et propriétés des alliages métalliques.**
Paris, Dunod, éditeur. 1 volume (13,5×20,5 cm.) de 208 pages avec 112 figures et 12 planches hors texte. (Prix : broché, 680 fr. français.)

---

**1948** 624 (06
**Publication préliminaire du Troisième Congrès de l'Association Internationale des Ponts et Charpentes (Liège, 13-18 septembre 1948).**
Edité par le Secrétariat Général du Comité belge d'organisation du Congrès de Liège, 139, quai de Rome, à Liège, et 38, boulevard Bischoffsheim, Bruxelles. 1 volume (17×25 cm.) de 698 pages, avec de nombreuses figures.

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**1948** 624
**TORDA (G.).**
**Théories et pratiques du calcul des constructions.** Formules et tableaux numériques pour des pièces de construction courantes, avec 58 exemples numériques.
Paris, Dunod, éditeur. 1 volume (22,5×28 cm.) de X — 358 pages, avec 201 figures et tableaux. (Prix : 1940 fr. français.)

### In German.

**1948** 656 .25
**FELBER (E.).**
**Signale und Stellwerke.**
Zürich, Orell-Füssli Verlag. 1 Band in-8, 80 Seiten, 3 Diagramme und 51 Abbildungen. (Preis : broschiert, 3 Schw. Fr.)

### In English.

**1947** 621 .392
**Argonarc welding** (Collected papers on argonarc welding presented to the L.M. 3 Committee ou fusion welding of magnesium rich alloys).
London : British Welding Association. Paper, 8 1/2 × 11 inches, 44 pp., illus., diagrams, charts, tables. (Price : 7s.6d.)

---

**1948** 621 .32
**ATKINSON (A. D. S.).**
**Fluorescent lighting.**
Third edition.
London : Georges Newnes, Limited, Tower House, Southampton Street, Strand, W.C.2. (Price : 12s.6d. net.)

---

**1948** 657
**BLOCKER (J. G.).**
**Cost accounting.**
Second edition.
McGraw-Hill Book Company, Incorporated, 330, West 42nd street, New York 18, U.S.A. (Price : $ 5.50.)

---

**1948** 625 .113 (42)
**Gradients of the British main-line railways.**
London : The Railway Publishing Company, Limited, 33, Tothill street. Westminster, S.W.1. (Price : 10s.)

---

**1948** 62
**The Civil Engineer in War. A symposium of papers on war-time engineering problems.**
Volume I. — **Airfields, Roads, Railways and Bridges.**
Volume II. — **Docks and Harbours.**
Volume III. — **Properties of materials, Structures, Hydraulics, Tunnelling and Surveying.**
The Secretary, The Institution of Civil Engineers, Great George Street, London, S.W.1. (Price : 42s. net the set of 3 volumes.)

---

**1944** 385. (062 (931), 621 .13 (06 (931) & 625 .2 (06 (931)
**The New Zealand Railway Observer.**
Volume I.
Petone (New Zealand) Published by the New Zealand Railway Correspondence Society, 30, Plunket Avenue. Paper covers, 50 pages (1'1"× 8 1/4").

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(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway science », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

### In Italian.

**1947** 625
**BALATRONI (F.).**
**Via e mezzi di trasporti. (Costruzioni stradali e ferroviarie. — Tecnica ed economia dei trasporti.)**
Milano, Istituto Editoriale Cisalpino. 1 volume di 750 pagine. (Prezzo : 3 000 lire.)

**1948** 625
**STABILINI (L.).**
**Costruzioni stradali e ferroviarie.** Volume I, 2ª edizione.
Milano, Libreria Editrice Politecnica C. Tamburini. 1 volume di 229 pagine. (Prezzo : 1 100 lire.)

### In Dutch.

**1948** 621 .13 (
**LABRIJN (P.).**
**De stoomlocomotief. Handleiding voor het locomoti personeel.**
Utrecht, N. V. A. Oosthoek's Uitgever Mij. 2 band (15×21 cm.), 243 bladzijden tekst en 199 blz. figure met 2 losse platen. (Prijs : gebonden, voor beide del samen, Fl. 9.50.)

[ 016. 385. (05 ]

## II. — PERIODICALS.

### In French.

#### Annales des Ponts et Chaussées. (Paris.)

**1948** 624 .6 & 721 .4
Annales des Ponts et Chaussées, janvier-février, p. 11.
ROBINSON (J. R.). — La **compensation des arcs.** (6 000 mots & fig.)

**1948** 62. (01
Annales des Ponts et Chaussées, janvier-février, p. 83.
CAQUOT. — **Action sur un massif, limité à un plan, d'une charge distribuée sur une droite de ce plan,** normalement à celui-ci et de densité constante *p* par unité de longueur. (1 000 mots & fig.)

#### Bulletin de Documentation technique S.N.C.F. (Paris.)

**1948** 621 .431 .72 (.42)
Bulletin de documentation technique S.N.C.F., mars, p. 59.
La nouvelle **locomotive Diesel-électrique de 1 600 ch.** du L.M.S.R. (2 000 mots & fig.)

**1948** 625 .251
Bulletin de documentation technique S.N.C.F., mars, p. 61.
Nouveau dispositif pour **freinage à la charge.** (600 mots & fig.)

**1948** 621 .433
Bulletin de documentation technique S.N.C.F., avril, p. 91.
Le **moteur à gaz chaud.** (2 500 mots & fig.)

**1948** 625 .243 (73)
Bulletin de documentation technique S.N.C.F., mai, p. 123.
Le **nouveau wagon couvert type PS 1** de la Pullmann Car Co. (1 600 mots & fig.)

**1948** 621 .
Bulletin de documentation technique S.N.C.F., jui p. 155.
La **localisation des défauts dans les câbles électrique** (1 200 mots & fig.)

#### Bulletin des Transports internationaux par chemins de fer. (Berne.)

**1948** 385 .113 (.48
Bulletin des transports internationaux par ch. de fe avril, p. 148.
Les **Chemins de fer de l'Etat danois** en 1946/194 (1 000 mots.)

**1948** 313 : 385 (.48
Bulletin des transports internationaux par ch. de fe avril, p. 151.
Les **Chemins de fer suédois** en 1946. (Tableau.)

**1948** 385 .(
Bulletin des transports internationaux par ch. de fe mai, p. 161.
SANTONI (G.). — **L'extinction du droit d'optio entre les chemins de fer** contre lesquels l'action peut êt exercée en vertu de l'art. 42 de la C.I.M. (2 000 mots

**1948** 385 .(
Bulletin des transports internationaux par ch. de fe mai, p. 178.
L'application du **Règlement pour l'emploi réciproq des wagons en trafic international** (R.I.V.). (1 000 mots

#### Economie et Technique des Transports. (Lucerne.)

**1947** 625 .
Economie et technique des transports, nº 74/76, octobr décembre, p. 104.
TITTELBACH (F.). — Structure et calcul de caiss **poutres pour véhicules sur rails.** (2 500 mots & fig.)

1948 621 .33
·onomie et technique des transports, nº 77, janvier, p. 2.
HUG (Ad.-M.). — Exploitation ferroviaire, **électrification, système de courant.** Considérations générales sur état actuel. (1 500 mots.)

1948 388 (73)
conomie et technique des transports, nº 78/79, février-mars, p. 14.
STETZA (G.). — Boston — un des plus beaux et plus grands **réseaux de transports en commun** du monde. 5 000 mots & fig.)

1948 621 .335
conomie et technique des transports, nº 78/79, février-mars, p. 24.
La **commande giratoire « Gyro »** d'Oerlikon, pour véhicules moteurs. (1 000 mots & fig.).

## Machines et Métaux. (Paris.)

1948 669
Machines et Métaux, avril, p. 111.
HEDDE d'ENTREMONT (B.). — Introduction aux **traitements thermiques modernes : trempes isothermes.** (2 500 mots, tableaux & fig.)

1948 621 .82
Machines et Métaux, mai, p. 157.
PICARD (F.) et BUTY (L.). — Etude des **coussinets.** Le facteur d'usure. (2 000 mots, tableaux & fig.)

1948 669 .1
Machines et Métaux, mai, p. 170.
Le **revenu des aciers à outils.** (3 500 mots & fig.)

1948 621 .82 & 621 .89
Machines et Métaux, juin, p. 193.
MARCELIN (A.). — **Niveaux de frottement.** (4 500 mots & fig.)

## L'Ossature métallique. (Bruxelles.)

1948 624 .62 (44)
L'Ossature métallique, mai, p. 223.
SCHMID (A.). — **Construction du pont** d'Argenteuil. (3 600 mots & fig.)

1948 624 .32 (439)
L'Ossature métallique, mai, p. 230.
KORANYI (I.). — **Reconstruction des ponts-rails détruits** en Hongrie. (4 000 mots & fig.)

1948 62. (01 & 621 .392
L'Ossature métallique, mai, p. 246.
SOETE (W.), VANCROMBRUGGE (R.) et DE WULF (Ch.). — Détermination des **tensions résiduelles dans quelques constructions soudées.** (3 000 mots, tabl. & fig.)

## Rail et Route. (Paris.)

1948 385. (09 .3 (44)
Rail et Route, avril, p. 3; mai, p. 1.
L'histoire de nos chemins de fer. La **Région Ouest** (2 000 mots & fig.)

1948 385 (493)
Rail et Route, avril, p. 9.
DELORY (F.). — **Perspectives d'avenir** des Chemins de fer belges. (1 700 mots & fig.)

1948 385. (09 (92)
Rail et Route, mai, p. 9.
REITSMA (S. A.). — Les **Chemins de fer** des Indes néerlandaises. (2 000 mots & fig.)

1948 621 .138 .1
Rail et Route, juin, p. 1; juillet, p. 5.
RUBINSTEIN (J.). — Les dépôts modernes de machines à vapeur. (3 500 mots & fig.)

## Revue de l'Aluminium (Paris).

1948 669 .71
Revue de l'Aluminium, mars, p. 93.
CHEVIGNY (R.) et SYRE (R.). — Le **traitement thermique de réversion.** (2 200 mots & fig.)

1948 624 & 669 .71
Revue de l'Aluminium, avril, p. 123.
REINHOLD (J.). — Les **ponts en aluminium,** engins de levage et excavateurs. (5 000 mots & fig.)

## Revue générale des chemins de fer. (Paris.)

1948 656 .212 .7 (44)
Revue générale des chemins de fer, août, p. 257.
MARCHAND. — La **halle unique** sur la S.N.C.F. (6 000 mots & fig.)

1948 656 .222 .6 (44)
Revue générale des chemins de fer, août, p. 266.
GUERVILLE. — Les **trains du régime** accéléré de la Région du Sud-Ouest de la S.N.C.F. (5 000 mots & fig.)

1948 624 .32 (44)
Revue générale des chemins de fer, août, p. 272.
GRANIER. — **Reconstruction du** viaduc de Saint-André-de-Cubzac. (2 500 mots & fig.)

1948 625 .14 (01
Revue générale des chemins de fer, août, p. 279.
SONNEVILLE et SERGE. — Le **soulèvement des voies ferrées.** Etude expérimentale. (1 500 mots & fig.)

1948 385 .52 (44)
Revue générale des chemins de fer, août, p. 282.
Le **mandatement de la solde du personnel** à la S.N.C.F. (1 500 mots.)

## Revue universelle des Mines. (Liége.)

**1948** 621 .33 (.493)
Revue universelle des Mines, nº 4, avril, p. 298.
RULOT (N.). — **L'électrification** des Chemins de fer belges. (8 000 mots & tableaux.)

---

## La Technique moderne. (Paris.)

**1948** 621 .33 (44)
La Technique Moderne, 1er et 15 mars, p. 73; 1er et 15 mai, p. 153.
GARREAU (M.). — **L'électrification** de Paris-Lyon. Les **lignes à haute tension** et les **sous-stations** de traction. (7 000 mots & fig.)

**1948** 621 .3
La Technique moderne, 1er et 15 mars, p.85.
BEAUVAIS (G.). — Recherches récentes sur les **isolants électriques.** (3 000 mots & fig.)

**1948** 621 .331 (44)
La Technique moderne, 1er et 15 mai, p. 145.
CHAMAYOU. — **L'automaticité dans les usines hydro-électriques** de la S.N.C.F. (4 000 mots & fig.)

**1948** 621 .43
La Technique moderne, 1er et 15 juin, p. 193.
Récents progrès dans la technique des **moteurs à explosion.** (5 500 mots & fig.)

---

## Trains. (Bruxelles.)

**1947** 725 .31 (493)
Trains, décembre, p. 11.
BRUNFAUT (M.). — La **Halte Centrale.** (Jonction Nord-Midi.) (2 500 mots & fig.)

**1947** 625 .13 (493)
Trains, décembre, p. 21.
MEULEMANS (G.). — La **ventilation du Tunnel.** (Jonction Nord-Midi.) (5 000 mots & fig.)

**1947** 624 (493) & 625 .1 (493)
Trains, décembre, pp. 27 et 51.
LOMBARD. — Le **viaduc Sud.** (10 000 mots & fig.)
DE SAEGHER. — Les **viaducs Nord et les murs de soutènement** dans les travaux de la Jonction Nord-Midi. (3 500 mots & fig.)

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# In German.

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## Glasers Annalen. (Berlin.)

**1948** 656 .222 .5
Glasers Annalen, Heft 6, Juni, S. 81.
NORDMANN. — **Verlangsamte Fahrpläne.** (2 500 Wörter.)

**1948** 621 .131
Glasers Annalen, Heft 6, Juni, S. 83; Heft 7, Juli, S. 1
EWALD. (K.). — **Spezifisches Zuggewicht und teilige Zugkraft.** (9 000 Wörter, Tafeln & Abb.)

**1948** 621 .3
Glasers Annalen, Heft 7, Juli, S. 97.
SPILLER (H.). — Zur geschichtlichen Entwicklu der **Schweisstechnik.** (6 000 Wörter.)

**1948** 621 .133
Glasers Annalen, Heft 7, Juli, S. 106.
METZELTIN (E.). — **Feuerbüchsstahl.** (3 000 Wörter

---

## Signal und Draht. (Frankfurt a./Mein.)

**1948** 656 .2
Signal und Draht, Nr. 6, S. 64.
SCHMITZ (W.). — Die Darstellung von Schaltunge im **Eisenbahnsicherungswesen.** (2 000 Wörter & Abb.)

**1948** 656 .25 (494
Signal und Draht, Nr. 6, S. 66.
BORN (E.). — Die Entwicklungsrichtungen im **schwe zerischen Eisenbahn-Signalbau.** (2 000 Wörter & Tafel

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# In English.

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## The Locomotive. (London.)

**1948** 621 .132 .6 & 621 .133
The Locomotive, August 14, p. 116.
**Oil-fired 0-6-0 tender locomotives.** (200 words & fig.

**1948** 621 .431 .72 (437
The Locomotive, August 14, p. 117.
**Diesel-electric railcars for Czechoslovakia.** (200 word & fig.)

**1948** 621 .131
The Locomotive, August 14, p. 118.
**Appproximate calculations of the speed-power capacit and of the operating range of a steam locomotive.** (1 40 words & tables.)

**1948** 621 .138 .2 (42
The Locomotive, August 14, p. 121.
**The Berkley mechanical stoker.** (400 words & fig.)

**1948** 621 .438 (73
The Locomotive, August 14, p. 123.
**C. & O. turbine-electric loco.** (800 words & fig.)

**1948** 621 .431 .7
The Locomotive, August 14, p. 125.
DOHERTY (J. M.). — **The internal combustion loc motive** (to be continued). (1 000 words & fig.)

## Mechanical Engineering. (New York.)

**1948** **669**
Mechanical Engineering, July, p. 609.
MAXON (C. R.). — **The importance of cores in die-casting design.** (5 000 words & fig.)

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**1948** **669 .1**
Mechanical Engineering, August, p. 667.
SEFING (F.). — Unappreciated **advantages of modern gray iron.** (2 200 words & fig.)

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**1948** **621 .438 (73)**
Mechanical Engineering, September, p. 771.
**Locomotive gas-turbine power plant.** (Comment by J. T. RETTALIATA.) (1 000 words.)

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## Modern Transport. (London.)

**1948** **621 .132 .3 (42) & 621 .133 .3 (42)**
Modern Transport, May 15, p. 16.
POULTNEY (E. C.). — Landmarks of express locomotive progress — 10. — Part. I. — **Boiler proportions.** (1 400 words, tables & fig.)

---

**1948** **625 .17 (42)**
Modern Transport, May 22, p. 13.
**Foundations of railway permanent way.** Improvement by blanketing. (1 200 words & fig.)

---

**1948** **621 .133 .1 (41)**
Modern Transport, May 29, p. 12.
**Locomotive fuels in Eire. Conversions to oil** by C.I.E. and G.N.R. (1 400 words & fig.)

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**1948** **625 .25 (09 (42)**
Modern Transport, June 5, p. 19.
**Victorian railway carriages.** Some hand-picked specimens. (1 800 words & fig.)

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**1948** **621 .132 .5 (42)**
Modern Transport, June 12, p. 5.
**Beyer-Garratt articulated locomotives.** (1 200 words & fig.)

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**1948** **625 .232 (44)**
Modern Transport, June 12, p. 7.
**Pneumatic trailer coaches on S.N.C.F.** (80 words & fig.)

---

**1948** **621 .132 .3 (42) & 656 .222 .1 (42)**
Modern Transport, June 19, p. 15.
POULTNEY (E. C.). — **Landmarks of express locomotives progress.** — 10. — Part. II. — Performance 50 years ago. (1 200 words & fig.)

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**1948** **656 .226 (44)**
Modern Transport, June 26, p. 13.
**Railway parcels services in Paris.** (1 000 words & fig.)

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**1948** **621 .138 .2 (42)**
Modern Transport, June 26, p. 15.
**Mechanical stoker on B.R. locomotive.** (500 words & fig.)

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**1948** **656 .225 (41)**
Modern Transport, July 3, p. 15.
Bread transport by rail. New method introduced by G.N.R. (I.). — **Ingenious use of containers.** (800 words & fig.)

---

**1948** **625 .164 (42)**
Modern Transport, July 10, p. 3.
Engineering developments of London Transport. — **Ensuring reliability of service.** (1 200 words & fig.).

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**1948** **625 .232 (42)**
Modern Transport, July 10, p. 9.
**New Doncaster-built buffet cars.** (600 words & fig.)

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**1948** **621 .431 .72 (.5)**
Modern Transport, July 17, p. 8.
For shunting in Malaya. — English Electric **Diesel-electric locomotives.** (400 words & fig.)

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**1948** **621 .132 .4 (42)**
Modern Transport, July 24, p. 8.
**An L.N.E.R. locomotive reconstruction.** (400 words & fig.)

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## The Oil Engine and Gas Turbine. (London.)

**1948** **621 .431 .72 (62)**
The Oil Engine and Gas Turbine, June, p. 66.
**Fifteen shunters for Egypt.** (400 words & fig.)

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**1948** **621 .438 (494)**
The Oil Engine and Gas Turbine, July, p. 101.
**The pioneer G.T. locomotive.** (1 200 words & fig.)

---

**1948** **621 .133 .1 (42) & 621 .431 .72 (42)**
The Oil Engine and Gas Turbine, August, p. 126.
McARD (G. W.). — **Refuelling Diesel rail units.** (1 400 words & fig.)

---

## Proceedings, American Society of Civil Engineers. (New York.)

**1948** **62 (01**
Proceedings, American Society of Civil Engineers, February, p. 161.
NEIMAN (A. S.). — **Shearing tress distribution** in box girders with multiple webs. (2 800 words, tables & fig.)

---

**1948** **62 (01**
Proceedings, American Society of Civil Engineers, February, p. 193.
JULIAN (O. G.) and DE VRIES (K.). — **Strength of beams** as determined by lateral buckling. (7 200 words, tables & fig.)

---

**1948** **624 : 691 & 721 .9**
Proceedings, American Society of Civil Engineers, March, p. 287.
RICHART (F. E.). — Laboratory research **on concrete bridge floors.** (7 400 words, tables & fig.)
NEWMARK (N. M.). — **Design of I-beam bridges** (12 000 words, tables & fig.)
SIESS (C. P.). — **Composite construction for I-beam bridges.** (8 000 words, tables & fig.)

## Railway Age. (New York.)

**1948** **656 .254 (73)**
Railway Age, May 29, p. 31.
Steel plant utilizes **railroad radio.** (800 words & fig.)

**1948** **621 .32 (73)**
Railway Age, May 29, p. 32.
**Sealed-beam headlights.** (400 words & fig.).

**1948** **625 .232 (73)**
Railway Age, May 29, p. 48.
**New Haven passengers** get what they asked for — $ 20 000 000 worth. (2 200 words & fig.)

**1948** **625 .142 .4 (73)**
Railway Age, May 29, p. 60.
M'ILMOYLE (R. L.). — British Railways using **concrete ties.** (1 800 words & fig.)

## Railway Engineering and Maintenance. (Chicago.)

**1948** **625 .142 .2 (73)**
Railway Engineering and Maintenance, July, p. 704.
**Extensive test to give « low down » on tie wear.** (3 000 words & fig.)

**1948** **625 .173 (73)**
Railway Engineering and Maintenance, August, p. 806.
LORD (W. H.). — **Maintaining railroad curves with a string.** (1-600 words & fig.)

**1948** **621 .431 .72 (73)**
Railway Engineering and Maintenance, August, p. 812.
BLACK (W. W.). — **Dirt-free Diesel operation.** (1 200 words & fig.)

**1948** **691 (73)**
Railway Engineering and Maintenance, August, p. 815.
BOASE (A. J.). — **How to get better concrete-curing and protection.** (2 000 words & fig.)

## Railway Gazette. (London.)

**1948** **385 (09 (42)**
Railway Gazette, No. 10, March 5, p. 274.
TRAIN (J. C. L.). — **British Railways under nationalisation.** (2 000 words.)

**1948** **621 .335 (73) & 621 .438 (73)**
Railway Gazette, No. 10, March 5, p. 277.
**Turbine-electric locomotives** for the Chesapeake & Ohio Railway. (2 800 words & fig.)

**1948** **656 .281 (42)**
Railway Gazette, No. 10, March 5, p. 287.
**Ministry of Transport accident report.** — Polesworth, L.M.S.R.: July 21, 1947. (2 200 words & fig.)

**1948** **656 .212 (68)**
Railway Gazette, No. 11, March 12, p. 303.
**The prospect goods station, Johannesburg.** (500 words & fig.)

**1948** **385 .1 (42**
Railway Gazette, No. 11, March 12, p. 314.
**Great Western Railway Company.** — Final genera meeting. (800 words.)

**1948** **385 .1 (42**
Railway Gazette, No. 11, March 12, p. 316.
**L.M.S.R. Company.** — Final general meeting. (1 80 words.)

**1948** **385 .1 (42**
Railway Gazette, No. 11, March 12, p. 318.
**L.N.E.R. Company.** — Final general meeting. (3 00 words.)

**1948** **385 .1 (42**
Railway Gazette, No. 11, March 12, p. 323.
**S.R. Company.** — Final general meeting. (3 000 words.

**1948** **385 .1 (41**
Railway Gazette, No. 11, March 12, p. 328.
Great Northern Railway (Ireland). General meetin (700 words.)

**1948** **385 .32 (42**
Railway Gazette, No. 12, March 19, p. 347.
**British Transport Commission. — Railway Executive** (1 900 words & charts.)

**1948** **625 .242 (42**
Railway Gazette, No. 12, March 19, p. 350.
**Development of automatic lifts by London Transport** (1 200 words & fig.)

**1948** **656 .25 (44**
Railway Gazette, No. 12, March 19, p. 352.
**S.N.C.F. central signalling laboratory.** (400 words & fig.)

**1948** **385. (09 (438**
Railway Gazette, No. 12, March 19, p. 353.
**Polish Railway development plans.** (600 words & fig.)

**1948** **621 .132 .7 (68**
Railway Gazette, No. 12, March 19, p. 354.
**Shunting locomotives built by South African Railways.** (500 words & fig.)

**1948** **621 .336**
Railway Gazette, No. 13, March 26, p. 374.
PRIGMORE (B. J.). — **Automatic acceleration of traction motors.** (1 200 words & fig.)

**1948** **621 .33 (438**
Railway Gazette, No. 13, March 26, p. 376.
**Electrification in Warsaw.** (600 words & map.)

**1948** **691 (42**
Railway Gazette, No. 13, March 26, p. 378.
**L.M.R. pre-cast concrete production.** (1 200 words & fig.)

**1948** **656 .281 (42**
Railway Gazette, No. 13, March 26, p. 387.
**Ministry of Transport Accident Report.** Bletchley L.M.S.R.: May 29, 1947. (600 words.)

**1948** 388 (42)
Railway Gazette, No. 14, April 2, p. 402.
**The London traffic problem.** (800 words & map.)

**1948** 621 .138 .5 (44) & 725 .33 (44)
Railway Gazette, No. 14, April 2, p. 405.
**Concrete roundhouse** construction in France. (1 800 words & fig.)

**1948** 625 .173 (42)
Railway Gazette, No. 14, April 2, p. 408.
**Relaying in Polhill tunnel,** Southern Region. (800 words & fig.)

### Railway Magazine. (London.)

**1948** 625 .13 (42)
The Railway Magazine, Sept.-Oct., p. 298.
**Weekend works in the Severn Tunnel.** (1 600 words & fig.)

## In Spanish.

### Revista de Ciencia aplicada. (Madrid.)

**1948** 62. (01 & 621 .392
Revista de Ciencia aplicada, abril-junio, p. 81.
BUSTELO (F.). — La **fractura cristalina en las estructuras soldadas** y la temperatura de transición de los aceros. (3 000 palabras & fig.)

**1948** 62. (01
Revista de Ciencia aplicada, abril-junio, p. 87.
VELASCO DE PANDO (M.). — La **rotura de los cuerpos.** (4 000 palabras & fig.)

### Revista de Obras Públicas. (Madrid.)

**1948** 621 .332
Revista de Obras públicas, junio, p. 237.
SERRET (R. M.). — **Posibles economias en las lineas catenarias** de las electrificaciones ferroviarias. (8 000 palabras & fig.)

**1948** 624 (45)
Revista de Obras pûblicas, agosto, p. 303.
MENDIZABAL (D.). — Normas para el **calculo de tramos metalicos,** dictadas en Italia. (1 000 palabras & fig.)

**1948** 62. (01 & 691
Revista de Obras pûblicas, agosto, p. 327.
S. CRUZ JIMENEZ (A.). — **Calculo de secciones rectangulares de hormigon armado** sometidas a simple flexion. (800 palabras, 2 tablas & fig.)

### Revista del Colegio de Ingenieros de Venezuela. (Caracas-Venezuela.)

**1947** 691
Revista del Colegio de Ingenieros de Venezuela, nº 165, mayo-junio, p. 126.
AMADOR (F. J.). — **El problema de la corrosión.** (7 000 palabras & fig.)

## In Italian.

### L'Ingegnere. (Milano.)

**1948** 624 .2
L'Ingegnere, febbraio, p. 80.
PRIOLO (D.). — **Effetti di torsione nelle travate** a cassone dei ponti obliqui. (2 500 parole & fig.)

**1948** 62 (01 & 691
L'Ingegnere, aprile, p. 303.
CAVALLARI MURAT (A.). — Un procedimento di **prova all' urto dei conglomerati.** (6 000 parole & fig.)

**1948** 691 & 721 .9
L'Ingegnere, maggio, p. 369.
FORNACI (C.). — Gli **acciai per costruzioni in cemento armato.** (4 000 parole & tavole.)

### Ingegneria ferroviaria. (Roma.)

**1948** 621 .131 .1
Ingegneria ferroviaria, giugno, p. 337.
TARTARINI (W.). — **Caratteristiche di macchina e marcia a cavallo di livellette diverse.** (7 000 parole & fig.)

**1948** 621 .335
Ingegneria ferroviaria, giugno, p. 347.
STAGNI (E.). — Il **motore a sospensione tramviaria** nelle elettromotrici leggere a. c. c. (5 000 parole & fig.)

**1948** 385. (061 .5
Ingegneria ferroviaria, giugno, p. 355.
CUTTICA (A.). — La **riunione dell' U.I.C.** a Biarritz (24 maggio - 5 giugno 1948). (3 000 parole.)

**1948** 625 .232 (45)
Ingegneria ferroviaria, giugno, p. 365.
VERZILLO (R.). & GRANDINETTI (R.). — Il **nuovo treno** per il Presidente della Repubblica. (1 500 parole & fig.)

**1948** 621 .83 & 621 .431 .72
Ingegneria ferroviaria, giugno, p. 374.
BRACHET-SARGENT (L.). — La sincronizzazione nel **cambio di velocità meccanico.** (5 000 parole & fig.)

## In Norwegian. (= 439.82.)

### Teknisk Ukeblad. (Oslo.)

**1948** 656 .25 = 439 .82
Teknisk Ukeblad, No. 27, p. 345.
DUE (R.). — **Protecting turn-outs** on lines with electric control equipment. (900 words.)

## In Polish (= 91.885)

### Przeglad Komunikacyjny. (Warsaw.)

**1948** **621 .33 (438) = 91 .885**

Przeglad Komunikacyjny, No. 5, p. 209.

JAWORSKI (C.). — **Operative results of electric traction** in the Warsaw railway centre in 1938. (9 000 words & tables.)

**1948** **625 .13 (438) = 91 .885**

Przeglad Komunikacyjny, nº 3, p. 220.

KROLIKOWSKI (J.). — **Reconstruction of steel girders** of the Vistula railway bridge in Torûn. (8 000 words & fig.)

## In Swedish. (= 439.71)

### Meddelanden fran Svenska Lokaltrafik Föreningen. (Stockholm.)

**1948** **625 .42 (485) = 439 .71**

Meddelanden fran Svenska Lokaltrafik Föreningen, No. 2, p. 41.

HILLBOM (B.). — Preliminary problems regarding the **building of the underground railways** at Stockholm. (2 300 words.)

### Nordisk Järnbanetidskrift. (Stockholm.)

**1948** **385 .4 (485) = 439 .7**

Nordisk Järnbanetidskrift, No. 3, p. 59.

Organisation of the **general management** of t dish State Railways. (1 500 words.)

**1948** **313 . 385 = 439 .8**

Nordisk Järnbanetidskrift, No. 3, p. 63.

TORK (I. A.). — The application of **logarithmic parabola** in railway statistics. (3 700 words & fig.)

**1948** **656 .28 = 439 .7**

Nordisk Järnbanetidskrift, No. 3, p. 79.

HARD (T.). — May **railway accidents be prevented** by means other than technical ones? (1 500 words.)

**1948** **656 .23 = 439 .8**

Nordisk Järnbanetidskrift, No. 4, p. 93.

HEIR (O.). — **Railway tariff standardization.** (1 70 words.)

**1948** **625 .232 = 439 .7**

Nordisk Järnbanetidskrift, No. 4, p. 97.

THELANDER (T.). — The future **restaurant-car** (1 500 words.)

### Statsbane-Ingenjören. (Stockholm.)

**1948** **625 .14 (73) = 439 .7**

Statsbane-Ingenjören, No. 4, May, p. 97.

SCHÄDER (S. E.). — **American track.** (2 200 word & fig.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

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[ 016. 385. (02 ]

## I. — BOOKS.

### In French.

**1948** 669

**BASTIEN (P.).**

**Le magnésium et les alliages ultra-légers.**

Paris (6e), Dunod, éditeur, 92, rue Bonaparte. 1 volume (14×22) de x - 98 pages, avec 40 figures. (Prix : broché, 560 fr. français.)

**1947** 621 .3 (06 (492)

**Deuxième Congrès d'Electrothermie et d'Electrochimie** (La Haye, 3-4 septembre 1947).

**Compte rendu du Congrès.**

Arnhem, Nederlandsch Instituut voor Electrowarmte en Electrochemie, Utrechtse Weg, 210. (Prix : florins 20.— port en plus.)

(« Addendum à l'article sur le même sujet paru dans le Bulletin du Congrès » de septembre 1948, p. 603. »)

**1948** 385. (09 .3

**FALAIZE (J.) et GIROD-EYMERY (H.).**

**A travers les chemins de fer de l'origine à nos jours.**

Paris (7e), Editions Denoel, 19, rue Amélie. 1 volume broché de 411 pages.

**1948** 531. (02

**FAVRE (H.).**

**Cours de mécanique.** Tome II : **Dynamique des corps solides rigdes.**

Paris, Dunod, et Zurich, Leemann, éditeurs. 1 volume (16.5×24 cm.) de 434 pages, avec figures. (Prix : 380 fr. français.)

**1948** 697

**Manuel de ventilation.**

Paris, publié par la « Ventilation industrielle et Minière », 2, rue Paul Cézanne. — Gauthier-Villars, dépositaire. 1 volume (13.5×21) de 300 pages, avec 233 figures. (Prix : 600 fr. français.)

**1948** 621 .93

**RICORDEL (V.).**

**Notes pratiques sur les outillages à découper et à emboutir.**

Paris, Dunod, éditeur. 2 volumes (13×21 cm.) de 242 pages avec 118 figures et 92 pages avec 121 figures. (Prix : Tome I, 230 fr. français; Tome II, 130 fr. franç.)

### In English.

**1948** 385. (09 (42)

**BARRIE (D. S.) and CLINKER (C. R.).**

**The Somerset and Dorset Railway.**

The Oakwood Press, Tanglewood, South Godstone (Surrey). (Price : 7s. net, in paper covers or 8s.6d. net in cloth.)

**1947** 621 .43 (42)

**British Diesel engine catalogue.**

London : Temple Press Limited.

Cloth (9 3/4 × 13 1/4 in.) 247 pp. illus., diagrams, charts, tables. (Price : 42s.)

**1948** 621 .438 (42)

**HAYNE (C.).**

**Gas turbines and their problems.**

London : Todd Publishing Group Ltd, 49, Park Lane, W. 1. (Price : 7s.6d. net.)

**1948** 625 .28

**KIEFER (P. W.).**

**Railroad motive power.**

New York : Simmons-Boardman Publishing Company, 30, Church Street, New York, N. Y. (Price : 2 dollars.)

**1947** 621 .13 (09

**Locomotive Cyclopedia 1947.**

Thirteenth edition.

New York U.S.A. : Simmons Boardmann Publishing Corporation, 30, Church Street, New York, 7. One volume (11 3/4 in. × 8 1/2 in. × 2 1/4 in.) of 1 418 pages. (Price : 8 $.)

**1948** 691

**MANNING (G. P.).**

**Construction in reinforced concrete.**

Second edition.

London : Sir Isaac Pitman & Sons, Ltd., Pitman House, Parker Street, Kingsway, W. C. 2. (Price : 15s.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

1948 621 .134 .2

MERRITT (H. E.).

**Gear Trains.**

London : Sir Isaac Pitman and Sons Ltd., Pitman House, Parker Street, Kingsway, W. C. 2. (Price : 30 s.)

1948 624

PEIRSON (J. GORDON).

**The work of the bridge builders.**

Oxford: Pen-in-Hand Publishing Company Ltd., 11, St. Micheal Street. (Price : 7s.6d.)

1948 621 .3 (0

SAY (M. G.).

**Electrotechnology and Calculations.**

London : George Newnes Ltd., Tower House, Southampton Street, Strand, W. C. 2.

A book of 159 pages. (Price : 6s. net.)

1948 621 .438

TUCKER (W. B.).

**Construction of gas turbine for locomotive power plant.**

Semi-Annual Meeting paper No. 48-SA-54 (mimeographed). ASME publications, 29 West 39th Str. New York. (ASME papers. Price : 25 cents to members, 50 cents to nonmembers.)

## In Spanish.

1947 385. (06 .1 (7 + 8

COMISION INTERNACIONAL PERMANENTE DEL CONGRESO PANAMERICANO DE FERROCARRILES.

**V Congreso Panamericano de Ferrocarriles, Montevideo, abril 1946.**

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Tomo V. — Sección F : Asuntos generales. — 1 volumen (17×23 1/2 cm.), 562 paginas.

Montevideo, Talleres de « La Industrial Grafica Uruguaya » (L.I.G.U.), Cerrito, 740.

[ 016. 385. (05 ]

# II. — PERIODICALS.

## In French.

### Annales des Travaux publics de Belgique. (Bruxelles.)

1948 624 .63

Annales des trav. publics de Belgique, février, p. 53; avril, p. 233.

RIESSAUW (F. G.) & PASSELECQ (D. A.). — Essais sur les **articulations en béton armé.** (7 000 mots, tableaux & fig.)

1948 691

Annales des trav. publics de Belgique, février, p. 127, avril, p. 309.

SANTILMAN (H. N. F.). — Note sur l'**emploi du béton précontraint** dans la reconstruction des passerelles de la rue de Gosselies et de Malheide sur le Canal de Charleroi à Bruxelles. (6 000 mots, tableaux & fig.)

### Bulletin de l'Union Internationale des Chemins de fer. (Paris.)

1948 656 .257 (44)

Bulletin de l'Union intern. des ch. de fer, avril, p. 130.

WALTER. — Un nouveau type de **poste d'aiguillages à leviers d'itinéraires.** (8 000 mots & fig.)

1948 656 .235 (0

Bulletin de l'Union intern. des ch. de fer, avril, p. 153.

Dr. CANDELI. — Déclin ou évolution des principes classiques de la **tarification ferroviaire marchandises?** (2 000 mots.)

1948 621 .335 (485)

Bulletin de l'Union intern. des ch. de fer, avril, p. 156.

**Nouvelles rames électriques** des Chemins de fer de l'Etat suédois. (1 100 mots & fig.)

1948 385. (07 .4 (42)

Bulletin de l'Union intern. des ch. de fer, mai, p. 173.

Le **Musée des chemins de fer** à York. (1 200 mots et fig.)

1948 385. (09 (495)

Bulletin de l'Union intern. des ch. de fer, mai, p. 177.

La **reconstruction des chemins de fer** en Grèce. (2 500 mots, tableaux & carte.)

1948 656 .234 (494)

Bulletin de l'Union intern. des ch. de fer, mai, p. 180.

FALLET (Ed.-M.). — La récente **réforme des tarifs des voyageurs** des Chemins de fer fédéraux suisses. (8 000 mots & tableaux.)

### Bulletin technique de la Suisse romande. (Lausanne.)

1948 691

Bulletin technique de la Suisse romande, 31 juillet, p. 197.

PARIS (A.). — **La conception de l'ingénieur dans la construction massive.** (7 000 mots.)

1948 62. (01

Bulletin technique de la Suisse romande, 28 août, p. 227.

SCHNITZLER (E.). — **Contraintes et déformations en un point d'un système bidimensionnel.** (1 200 mots & fig.)

## Génie Civil. (Paris.)

**1948** **624 .2**
Génie Civil, n° 3233, 15 juillet, p. 270.
MASSE (R.). — Calcul des **poutres sur appuis élastiques.** Application aux ponts-routes à poutres multiples. (800 mots & fig.)

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**1948** **625 .122**
Génie Civil, n° 3233, 15 juillet, p. 272.
COUARD (A.). — Les **coefficients de poussée et de butée des terres pulvérulentes** et la longueur des tirants d'ancrage. (1 000 mots.)

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**1948** **532**
Génie Civil, n° 3235, 15 août, p. 304.
LEFRANC (E.). — Mesure de la **perméabilité des sols** en place et ses applications. (5 000 mots & fig.)

---

## L'Industrie des voies ferrées et des transports automobiles. (Paris.)

**1948** **621 .431 .72 (493)**
L'Industrie des Voies ferr. et des Transp. automobiles, avril, p. 252.
VRIELYNCK (W. A.). — Les **automotrices et tracteurs à moteur thermique** de la Société Nationale des Chemins de fer Vicinaux de Belgique. (3 000 mots, tableau & fig.)

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**1948** **625 .2 : 625 .62 (493)**
L'Industrie des Voies ferr. et des Transp. automobiles, juin, p. 290.
DEVIENNE. — **Transformations et aménagements du matériel roulant** aux Transports Urbains de l'agglomération bruxelloise. (5 500 mots & fig.)

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## L'Ossature métallique. (Bruxelles.)

**1948** **624 .32 (493)**
L'Ossature métallique, juin, p. 271.
Le **pont** de Lustin sur la Meuse. (1 500 mots & fig.)

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**1948** **624 (42)**
L'Ossature métallique, juin, p. 279.
**Ponts métalliques de faible portée** en Grande-Bretagne. (1 000 mots & fig.)

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**1948** **62. (01 & 669 .1**
L'Ossature métallique, juin, p. 286.
Le **calcul des profilés en tôles minces pliées.** (5 000 mots & fig.)

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## Revue générale des chemins de fer. (Paris.)

**1948** **656 .212 .5 (44)**
Revue générale des chemins de fer, juin, p. 181.
GEOFFROY (P.) et DINARD. — La transformation de la **gare de Villeneuve - St. Georges - Triage.** (8 000 mots & fig.)

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**1948** **625 .234 (44)**
Revue générale des chemins de fer, juin, p. 195.
CLEYET-MICHAUD. — Recherches expérimentales sur les **propriétés thermiques des parois des véhicules de chemins de fer.** (2 800 mots & fig.)

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**1948** **656 .254 (44)**
Revue générale des chemins de fer, juin, p. 200.
LECOMTE. — Le nouveau **poste de commandement** du 7e arrondissement de la Région de l'Est. (3 000 mots & fig.)

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**1948** **625 .13 (44)**
Revue générale des chemins de fer, juin, p. 206.
**Reconstruction du pont Eiffel** sur l'Oise. (1 000 mots & fig.)

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## Société Royale belge des Ingénieurs et des Industriels. (Bruxelles.)

**1948** **691**
Société royale belge des Ing. et des Industriels, Bulletin n° 2, p. 97.
POURBAIX (M.). — Contribution à l'étude de la **corrosion des métaux.** (6 000 mots & fig.)

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**1948** **62. (01 & 691**
Société royale belge des Ing. et des Industriels, Bulletin n° 3, p. 143.
MOENAERT (P.). — Etude critique des méthodes de **calcul du béton armé en flexion.** (12 000 mots & fig.)

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**1948** **62. (01 & 669**
Société royale belge des Ing. et des Industriels, Bulletin n° 3, p. 160.
SERVAIS (J.). — Considérations générales sur les **résultats des essais** effectués sur les matières provenant des ponts en fer et en acier dynamités en 1940. (13 000 mots, tableaux & fig.)

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**1948** **669**
Société royale belge des Ing. et des Industriels, Bulletin n° 3, p. 180.
DELBART (G.). — Récentes études françaises sur la **trempe étagée.** (9 000 mots, tableaux & fig.)

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## La Technique moderne. (Paris.)

**1948** **621 .33 (44)**
La Technique moderne, 1er et 15 juillet, p. 209.
VAUBOURDOLLE (R.). — **L'électrification** de Paris-Lyon. **L'équipement de la voie.** (3 000 mots & fig.)

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**1948** **621 .438**
La Technique moderne, 1er et 15 juillet, p. 216.
Le cycle équipression et la **turbine à gaz.** (3 500 mots.)

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**1948** **621 .335 (494)**
La Technique moderne, 1er et 15 juillet, p. 223.
**Locomotives d'express type « Bo-Bo »** de la ligne du Loetschberg. (2 000 mots & fig.)

## In German.

### Glasers Annalen. (Berlin.)

**1948** **62. (01 & 621**
Glasers Annalen, Heft 8, August, S. 113.
HÄNCHEN (R.). — **Berechnung der Maschinenteile unter oftmals wiederholter Belastung.** (5 000 Wörter & Abb.)

**1948** **621 .131 .2 & 621 .134**
Glasers Annalen, Heft 8, August, S. 119.
KALISCH (W.). — **Kondensation und Lokomotivgestaltung.** (5 000 Wörter & Abb.)

### Signal und Draht. (Frankfurt-a.-M.)

**1948** **656 .25**
Signal und Draht, Nr. 7, S. 73.
WARLICH (G.). — **Behelfsmässige Signalanlagen.** (4 000 Wörter & Abb.)

**1948** **656 .254**
Signal und Draht, Nr. 7, S. 78.
BUCKEL (R.). — **Störspannungen.** (1 600 Wörter.)

## In English.

### British Railways. Western Region Magazine. (London.)

**1948** **625 .232 (42) & 625 .26 (42)**
British Railway. Western Region Magazine, May, p. 91.
**Coaches and characters.** (800 words & fig.)

### Bulletin, American Railway Engineering Association. (Chicago.)

**1948** **625 .142 (73)**
Bulletin American Railway Engineering Association, June-July, p. 1.
**Design of tie plates.** (12 000 words, tables & fig.)

**1948** **625 .143 (94)**
Bulletin American Railway Engineering Association, June-July, p. 52.
**Butt welded rail in Australia.** (2 500 words.)

### The Engineer. (London.)

**1948** **625 .255 (42)**
The Engineer, May 7, p. 449.
**A vacuum brake exhauster.** (1 000 words & fig.)

**1948** **621 .134 .2 (42**
The Engineer, May 7, p. 450.
**Locomotive valve gear.** (400 words).

**1948** **621 .131 .3 (42**
The Engineer, May 7, p. 457.
ANDREWS (H. L.). — **The mobile locomotive testin plant of the London, Midland and Scottish Railway** (2 800 words & fig.)

**1948** **621 .431 .72 (41**
The Engineer, May 14, p. 479.
**Diesel-electric shunting locomotives for the Irish Rail ways.** (500 words & fig.)

**1948** **621 .132 .5 (73**
The Engineer, May, 28, p. 512; June 4, p. 537; June 11 p. 562.
POULTNEY (E. C.). — **Remarkable freight locomo tives : Pennsylvania Railroad** (to be continued). (6 80 words & fig.)

**1948** **625 .13 (44**
The Engineer, June, 4, p. 554.
DUGAS (R.). — and CARPENTIER (L.). — **Recon struction of French railway bridges.** (2 400 words & fig.

### Engineering. (London.)

**1948** **656 .25 (42**
Engineering, No. 4293, May 7, p. 451.
**Speed-controlled signalling and sand-trap turn-outs** (1 400 words & fig.)

**1948** **62. (0**
Engineering, No. 4294, May 14, p. 457.
WILLIS (A. H.). — **The analysis of strain and its gra phical representation.** (3 000 words & fig.)

**1948** **625 .4 (42**
Engineering, No. 4296, May 28, p. 522.
**Metropolitan Line improvements.** (1 100 words & fig.)

**1948** **621 .7 (42**
Engineering, No. 4297, June 4, p. 535.
**The cold welding of metals.** (1 000 words & fig.)

**1948** **621 .133 .**
Engineering, No. 4297, June 4, p. 549.
PENDENNIS WALLIS (Dr. R.). — **Combustion** (3 000 words & fig.)

### Journal and Proceedings, Institution of Mechanical Engineers. (London.

**1948** **625 .25 (**
Journal & Proceedings, Institution of Mechanical Engi neers, Journal, September and Proceeding. Vol. 15 No. 2, p. 209.
PARKER (R. C.) & MARSHALL (P. R.). — **Th measurement of the temperature of sliding surfaces, wit particular reference to railway brake blocks.** (9 000 word tables & fig.)

**1948** — 62. (01 & 669

Journal & Proceedings, Institution of Mechanical Engineers, Journal, September and Proceeding. Vol. 158, No. 2. p. 235.

HEYWOOD (R. B.). — **Modern application of photoelasticity.** (7 000 words & fig.)

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## Journal, Permanent Way Institution. (London).

**1948** — 656 .251 (42)

Journal, Permanent Way Institution, August, p. 99.

DAMON (A. W.). — **Colour light signalling.** (3 500 words.)

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**1948** — 385. (09 (45)

Journal, Permanent Way Institution, August, p. 123.

BARNWELL (F. R. L.). — **Railway reconstruction in Italy**, 1943-1946. (1 800 words & fig.)

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## The Locomotive. (London.)

**1948** — 621 .335 (44)

The Locomotive, August 14, p. 130.

**Twin motor coaches.** French National Railways. (200 words & fig.)

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## Modern Transport. (London.)

**1948** — 625 .173 (42)

Modern Transport, July 31, p. 6.

**High speed main-line track renewal.** (400 words & fig.)

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**1948** — 656 .281 (42)

Modern Transport, July 31, p. 7.

Goswick **derailment.** (2 000 words.)

---

**1948** — 656 .212 .6 (42)

Modern Transport, July 31, p. 9.

**Mechanical methods in goods handling.** (1 200 words.)

---

**1948** — 656 .212 .6 (42)

Modern Transport, July 31, p. 12.

**A shunting appliance.** The B.S.A. truck mover. (600 words & fig.)

---

**1948** — 625 .112 (6)

Modern Transport, August 7, p. 3.

FOXLEE (R. W.). — **Railway gauge** problems of tropical Africa. Discussion of unification. (1 200 words & fig.)

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**1948** — 621 .132 .7 (42)

Modern Transport, August 7, p. 5.

BAGNALL OF STAFFORD (W. G.). — British locomotives for export. Tank engines for Egypt and Turkey. (500 words & fig.)

---

**1948** — 621 .133 .1 (85)

Modern Transport, August, 7, p. 13.

**A lightweight metre-gauge locomotive. A 2-8-0 for use at over 12 000 feet. Low axle-load oil-burner.** (400 words & fig.)

---

**1948** — 721 .5 (42)

Modern Transport, August 14, p. 5.

**Replacing an historic station roof.** (1 200 words & fig.)

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**1948** — 656 .283 (42)

Modern Transport, August 14, p. 17.

**Incorrect emergency block working.** — Report on Farnborough collision. (1 200 words.)

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**1948** — 656 .281 (931)

Modern Transport, August 14, p. 18.

Report on New Zealand **railway accident. Excessive speed on a curve.** (300 words.)

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## Railway Age. (New York.)

**1948** — 621 .431 .72 (73)

Railway Age, June 12, p. 38.

DELANEY (J. P.) & HARRINGTON (H. M.). — **Alco G.E. road freight diesel locomotive.** (1 200 words & fig.)

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**1948** — 621 .431 .72 (73)

Railway Age, June 12, p. 50.

LOFTIS (J. D.). — **Development of diesel operation recorder** on the Atlantic Coast Line. (1 800 words & fig.)

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**1948** — 621 .138 .1 (73) & 621 .431 .72 (73)

Railway Age, June 12, p. 54.

**Diezelizing a locomotive repair shop.** (1 900 words & fig.)

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**1948** — 621 .431 .72 (73)

Railway Age, June 12, p. 37.

New Haven changes Maybrook **freight line to diesel.** (1 800 words & fig.)

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**1948** — 625 .212 (73)

Railway Age, June 26, p. 86.

**Evolution in chilled wheel rims.** (1 000 words & fig.)

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**1948** — 624 .5 (73)

Railway Age, June 26, p. 110.

HARRIS (A. R.). — **Ships and erects 162-ft. span as unit.** (1 400 words & fig.)

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## Railway Gazette. (London.)

**1948** — 656 .212 .5 (42)

Railway Gazette, No. 15, April 9, p. 430.

**Modernisation of Toton up yard, L.M.R.** (300 words & fig.)

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**1948** — 624 .7 (71)

Railway Gazette, No. 15, April 9, p. 432.

**Unusual viaduct reconstruction methods.** (400 words & fig.)

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**1948** — 621 .132 .7 (592)

Railway Gazette, No. 15, April 9, p. 435.

New shunting locomotives, Burma Railways. (400 words & fig.)

**1948** **621 .138 .5 (42)**
Railway Gazette, No. 16, April 16, p. 459.
AREND (A. G.). — **Traversing platforms in locomotive repair shops.** (800 words & fig.)

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**1948** **621 .132 .1 (41)**
Railway Gazette, No. 16, April 16, p. 461.
**New locomotives for G.N.R. (I.).** (800 words & fig.)

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**1948** **621 .95 (42)**
Railway Gazette, No. 16, April 16, p. 464.
**A heavy-duty railway wheel lathe.** (700 words & fig.)

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**1948** **625 .143 .5 (42)**
Railway Gazette, No. 16, April 16, p. 466.
**A remedy for loose chair screws.** (400 words & fig.)

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**1948** **385. (09 (46)**
Railway Gazette, No. 17, April 23, p. 487.
**A new Spanish main line.** (400 words & map.)

---

**1948** **625 .25 (02 (42)**
Railway Gazette, No. 17, April 23, p. 488; No. 25, June 18, p. 716; No. 11, Septembre 10, p. 296.
PRIGMORE (B. G.). — **Rheostatic and regenerative braking = 1-2-3** (to be continued). (2 200 words.)

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**1948** **621 .336 (42)**
Railway Gazette, No. 17, April 23, p. 489.
**Spring-controlled shoegear,** London Midland Region. (300 words & fig.)

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**1948** **621 .335 (81)**
Railway Gazette, No. 17, April 23, p. 490.
More British-built **stock for Brazil.** (300 words & fig.)

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**1948** **624 .1 (42)**
Railway Gazette, No. 17, April 23, p. 491.
**Screwcrete foundations for bridges and piers.** (1 000 words & fig.)

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**1948** **656 .285 (42)**
Railway Gazette, No. 17, April 23, p. 498.
**Ministry of Transport Accident Report :** Herne Hill, Southern Railway, November 6, 1947. (1 300 words & fig.)

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**1948** **621 .135 .2 (42)**
Railway Gazette, No. 18, April 30, p. 514.
**Manganese-steel Axlebox liners.** (1 400 words & fig.)

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**1948** **621 .335 (73)**
Railway Gazette, No. 18, April 30, p. 516.
The Chesapeake & Ohio Railway **turbo-electric locomotives.** (200 words & fig.)

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**1948** **656 .258 (42)**
Railway Gazette, No. 18, April 30, p. 521.
**New signalling at Darnetal,** French National Railways. (300 words & fig.)

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**1948** **656 .225 (73)**
Railway Gazette, No. 19, May 7, p. 545.
**Mechanised container experiments in the U.S.A.** (200 words & fig.)

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**1948** **621 .132 .1 (66**
Railway Gazette. No. 19, May 7, p. 547.
**Twenty new 2-8-2 locomotives for Nigerian Railway** (700 words & fig.)

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**1948** **625 .151 (42**
Railway Gazette, No. 19, May 7, p. 549.
**Unbroken main-line crossing for catch points.** (40 words & fig.)

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## University of Illinois Bulletin. (Urbana.)

**1947** **621 .131 .3 (73**
University of Illinois Bulletin, No. 11, October 4.
TUTHILL (J. K.). — The **railroad dynamometer ca** of the University of Illinois and the Illinois Central Rail road. (34 pages, illustrated.)

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**1947** **62. (01 (73) & 691 (73**
University of Illinois Bulletin. No. 22, November 28.
RICHART (F. E.) DRAFFIN (J. O.) OLSON (T. A. and HEITMAN (R. H.). — **The effect of eccentric load ing, protective shells, slenderness ratios, and othe variables in reinforced concrete columns.** (128 page illustrated.)

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**1947** **691 (73**
University of Illinois Bulletin, No. 23, December 3.
CRANDELL (J. S.) GLOVER (Y. L.) HUNTING TON (W. C.) LINDSAY (J. D.) RICHART (F. E. and WILEY (C. C.). — **Experience in Illinois with joint in concrete pavements.** (258 pages, illustrated.)

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## In Spanish.

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## Ferrocarriles y Tranvias. (Madrid.)

**1948** **621 .33 (494**
Ferrocarriles y Tranvias, Junio, p. 232; Julio, p. 269.
DE INZA (C.). — **La electrificación** de los ferrocarrile en Suiza. (10 000 palabras, tablas.)

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**1948** **621 .392 & 625 .26 : 625 .6**
Ferrocarriles y Tranvias, Junio, p. 235.
BADIAS AZNAR (L.). — **La soldadura eléctrica** en lo talleres de las explotaciones de tranvias. (1 000 palabra & fig.)

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**1948** **621 .133 .**
Ferrocarriles y Tranvias, Julio, p. 286.
BARBERENA MONTERO (J.). — **El consumo kilomé trico de combustible.** (1 500 palabras.)

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## Ferroviarios. (Madrid.)

**1948** **621 .33 & 656 .2**
Ferroviarios, Junio, p. 5.
CENDAN (C.). — **Coexistencia de las corrientes d señales con las de tracción** de las lineas electrificadas (2 500 palabras & fig.)

## In Italian.

### Alluminio. (Milano.)

**1948** **669 .71 & 691**

Alluminio, maggio-giugno, p. 225.

HUGONY (E.). — **La corrosione sotto tensione : risultati di ricerche effettuate su alcune leghe di alluminio.** (12 000 parole & fig.)

### Ingegneria ferroviaria. (Roma.)

**1948** **656 .2 (45)**

Ingegneria ferroviaria, luglio-agosto, p. 409.

DI RAIMONDO (G.). — Una grande tappa nella **ricostruzione delle Ferrovie Italiane dello Stato : l'orario 9 maggio 1948.** (5 000 parole & fig.)

**1948** **621 .135 .2 & 625 .212**

Ingegneria ferroviaria, luglio-agosto, p. 417.

GIORDANO (G.). — **Influenza di calettamenti forzati sulla resistenza di assi sottoposti a flessione e taglio,** con particolare riguardo agli assi ferroviari. Studio preparatorio. (7 000 parole & fig.)

**1948** **656**

Ingegneria ferroviaria, luglio-agosto, p. 425.

LALONI (N.). — **Concorrenza e cooperazione** tra ferrovia e automobile. (4 000 parole.)

**1948** **621 .132 .8**

Ingegneria ferroviaria, luglio-agosto, p. 429.

DE GREGORIO (C.). — Caratteristiche fluodinamiche e « capacità di lavoro » delle **locomotive ad accumulatore termico.** Prospettive per la loro carica mediante energia elettrica. (7 000 parole & fig.)

**1948** **55 (45)**

Ingegneria ferroviaria, luglio-agosto, p. 443.

DE ANGELIS D'OSSAT (G.). — **Osservazioni di geologia** applicata sugli scavi alla Stazione Termini di Roma. (6 000 parole & fig.)

**1948** **621 .33**

Ingegneria ferroviaria, luglio-agosto, p. 451.

ZATTONI (T.). — Metodo di calcolo dei **tempi di avviamento.** (800 parole & fig.)

**1948** **623 (45) & 625 .1 (45)**

Ingegneria ferroviaria, luglio-agosto, p. 453.

PERA (C.). — La **bonifica dei campi minati negli impianti ferroviari.** (4 000 parole, tavole & fig.)

## In Dutch.

### Spoor- en Tramwegen. (Utrecht.)

**1948** **621 .336**

Spoor- en Tramwegen, Nr 15, 15 Juli, p. 225.

ZWAAN (F.). — **N. S. stroomafnemers.** (4 000 woorden & fig.)

**1948** **388 (47)**

Spoor- en Tramwegen, Nr 15, 15 Juli, p. 231.

SCHUYT (K. C.). — Enige bijzonderheden over het **tegenwoordige stadsvervoer** in de Sovjet-Unie. (3 000 woorden & fig.)

**1948** **625 .232**

Spoor- en Tramwegen, Nr 16, 29 Juli, p. 249.

HOOFTMAN (J. C.). — **« Train of tomorrow ».** (2 500 woorden & fig.)

**1948** **656 .211 .5 (492)**

Spoor- en Tramwegen, Nr 17, 12 Augustus, p. 261.

BARDET (J. D. M.). — Nieuwe **personentunnel** te Utrecht. (1 300 woorden & fig.)

**1948** **625 .232 (492)**

Spoor- en Tramwegen, Nr 18, 26 Augustus, p. 273.

DOUWES DEKKER (C. E.). — Enige bijzonderheden omtrent de **inrichting van de Koninklijke Trein.** (2 000 woorden & fig.)

**1948** **621 .33 (494)**

Spoor- en Tramwegen, Nr 19, 9 September, p. 289.

De **electrische tractie** in Zwitserland. (2 500 woorden & fig).

## In Norwegian. (= 439.82.)

### Teknisk Ukeblad. (Oslo.)

**1948** **624 (489) = 439 .82**

Teknisk Ukebad, nº 39, p. 469.

HOLT (J.). — **Building of bridges in Denmark.** (2 200 words & fig.)

## In Polish (= 91.885)

### Przeglad Komunikacyjny. (Warsaw.)

**1948** **625 .143 .3 = 91 .885**

Przeglad Komunikacyjny, nº 6, p. 255.

GROBICKI (W.). — **Breaking of rails** and their causes. (4 500 words & fig.)

**1948** **621 .133 .6 (73) = 91 .885**

Przeglad Komunikacyjny, nº 6, p. 259.

KRAWCZYNSKI (F.). — American, **multivalve regulator.** (2 000 words & fig.)

**1948** **621 .133 .1 = 91 .885**

Przeglad Komunikacyjny, nº 6, p. 272.

KRZEMIENIECKI (A.). — Theoretical data regarding **coal consumption on Ty 246 locomotives.** (3 000 words & fig.)

**1948** **656 .27 = 91 .885**

Przeglad Komunikacyjny, nº 7, p. 319.

GROBICKI (W.). — **Rational operation of secondary railway lines.** (3 500 words.)

Przeglad Komunikacyjny, nº 7, p. 322.

**1948** **656 .23 = 91 .885**

Przeglad Komunikacyjnz, nº 7, p. 322.

PODWYSOCKI (S.). — **General principles of tariff policy** for transport enterprises. (12 000 words.)

## In Portuguese.

### Gazeta dos Caminhos de ferro. (Lisboa.)

**1948** **385 (55)**

Gazeta dos Caminhos de ferro, n° 1451, 1 de Junho, p. 327.

BIVAR (C.). — **Caminhos de ferro** do Iran. (1 000 palavras.)

**1948** **385. (09 (469)**

Gazeta dos Caminhos de ferro, n° 1454, 16 Julho, p. 380.

GALLO (J.). — **A rêde ferroviária de Portugal.** (1 500 palavras & fig.)

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**1948** **385 .22 (469)**

Gazeta dos Caminhos de ferro, n° 1454, 16 Julho, p. 383; n° 1455, 1 de Agosto, p. 447; n° 1456, 16 de Agosto, p. 463; n° 1457, 1 de Setembro, p. 483.

COELHO DOS REIS (J. L.). — Problemas nacionais. **Transportes maritimos e em Caminhos de ferro.** (6 000 palavras.)

M. Weissenbruch & Co., Ltd., Printer to the King, 49, rue du Poinçon, Bruxelles.

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| 385 .113. Results of working. Expenditure, etc. | | |
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| 385 .114. Cost of carrying individual units. | | |
| A dynamic approach to cost finding for railways, with special reference to the freight traffic of the Swedish State Railways, by Arne SJÖBERG . . . . | June. | 331 |
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| **385 .51. Relations between staff and management of railways.** | | |
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| List of the frontier points open to international traffic in such traffic relations as are subjected to the International conventions concerning the transport of goods by rail (CIM). *(New book)* . . . . . . . . . . . | June. | 391 |
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| La Locomotive. Description raisonnée de ses organes (4e édition) (The Locomotive. A methodical description of its component parts) (4th edition), by U. LAMALLE and F. LEGEIN . . . . . . . . . . . . | September. | 589 |
| La locomotive actuelle (The present day locomotive), by E. DEVERNAY . . | November. | 719 |
| La machine locomotive. Manuel pratique donnant la description des organes et du fonctionnement de la locomotive à l'usage des mécaniciens et chauffeurs (The locomotive. A practical handbook describing the components parts and working of the locomotive for the use of drivers and firemen) (10th edition), by E. SAUVAGE . . . . . . . . . . . . . . | November. | 720 |

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| Overheidsbemoeienis met het vervoer (Intervention of public authorities in transport), by Th. M. B. VAN MARLE. *(New book)* | » | 133 |
| Transportes terrestres. Concorrência e coordenaçâo. (Overland Transport. Competition and co-ordination), by J. F. LAPA. *(New book)* | March. | 200 |
| The co-ordination of road, rail and air services in Hyderabad State, India, by E. W. SLAUGHTER. *(New book)* | July. | 456 |
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| As regards passenger traffic, to report on the best policy for the organisation of the train services from the points of view of frequency and composition of trains, to ensure successful transport at the lowest possible cost, whilst giving passengers reasonable facilities. To consider in turn the cases of steam and electric lines, showing the extent of using steam trains and railcars for the former, and electric motor coaches and electrically driven trains for the latter, on lines with heavy, average, and light traffic, during and outside rush hours of the day (Question III, 14th Congress). — Discussion | January. | 3 |
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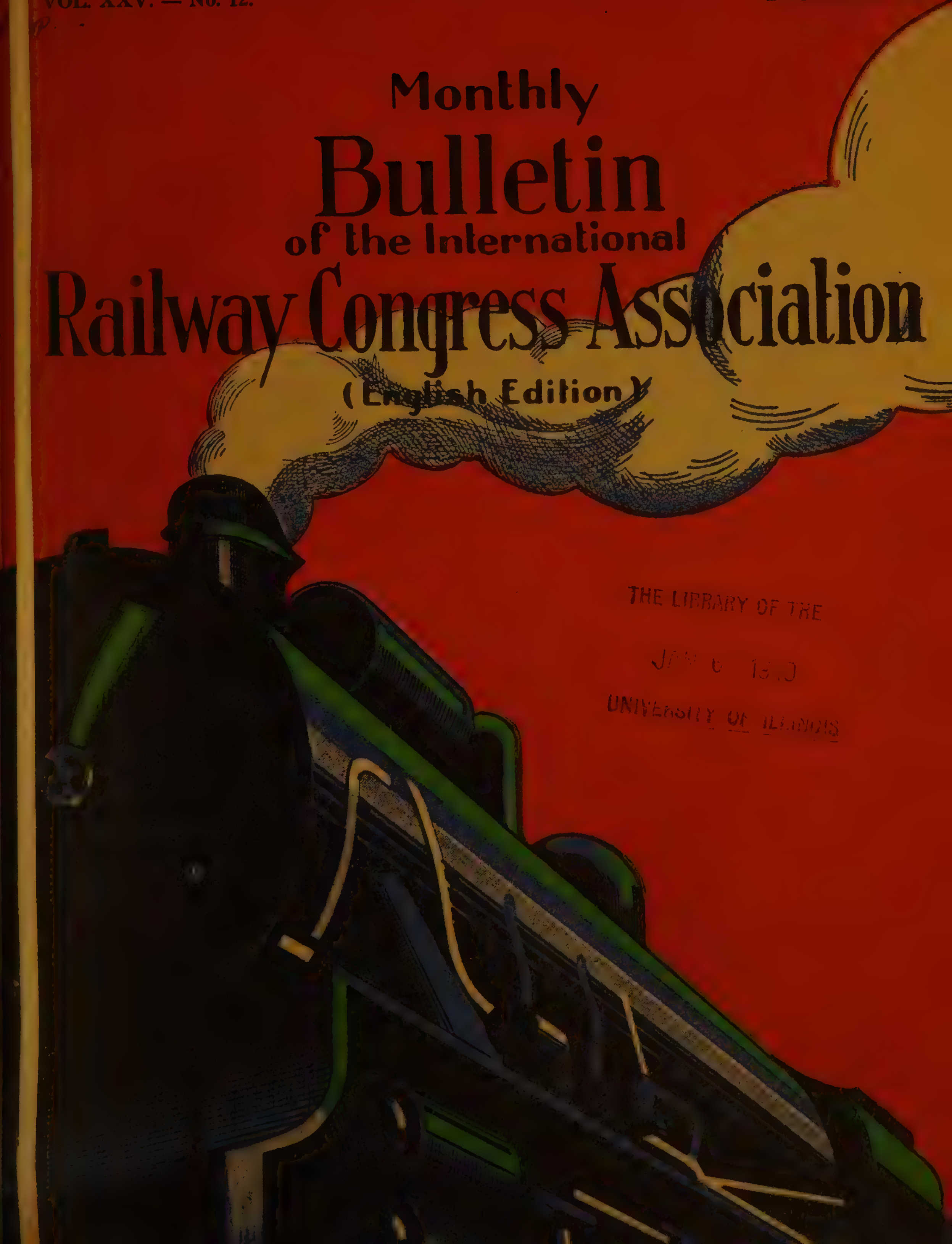
VOL. XXV. — No. 12. DECEMBER 1948

# Monthly Bulletin of the International Railway Congress Association

(English Edition)



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# Safety at high speeds

*Extract from « Railway Magazine », February, 1939.*

## L.N.E.R. WORLD SPEED RECORD

« All previous maxima were eclipsed in the brake trials of July 3, 1938, where the streamlined loco « A 4 » No. 4468, Mallard . . . secured for Great Britain the world's record for maximum speed with steam . . . Mallard, in the course of some brake trials which demanded very high speeds, worked a train of six Coronation vehicles weighing 237 tons empty and 240 tons full up to the terrific maximum of 125 m.p.h. in descending from Stoke to Tallington; for a very short distance, indeed, the dynamometer record showed 126 m.p.h.

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and immediately prior to making the speed record

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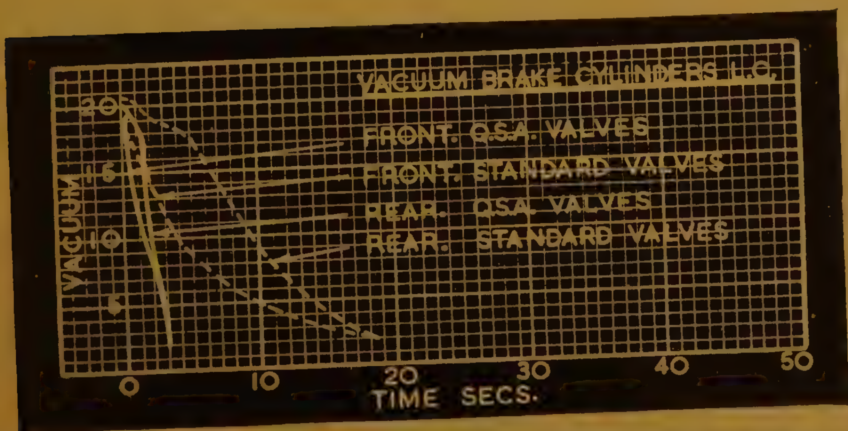
was made to test the efficiency of the brakes. (See graphs below.)




**These graphs show that the lower cylinder vacuum was reduced to 2 in. at the rear of the train in 3 seconds, when using Q.S.A. valves, as compared with 19 seconds with ordinary valves.**

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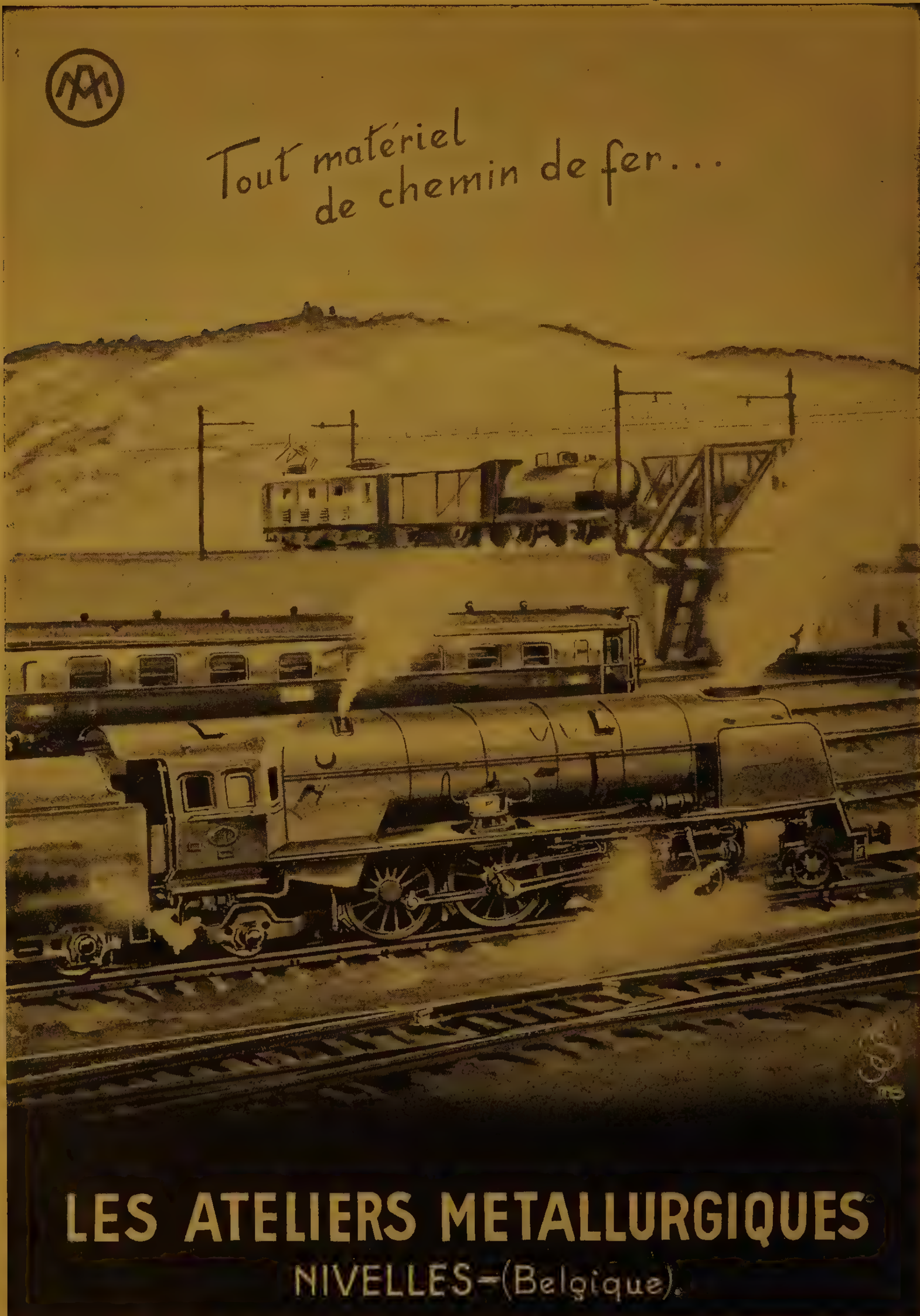


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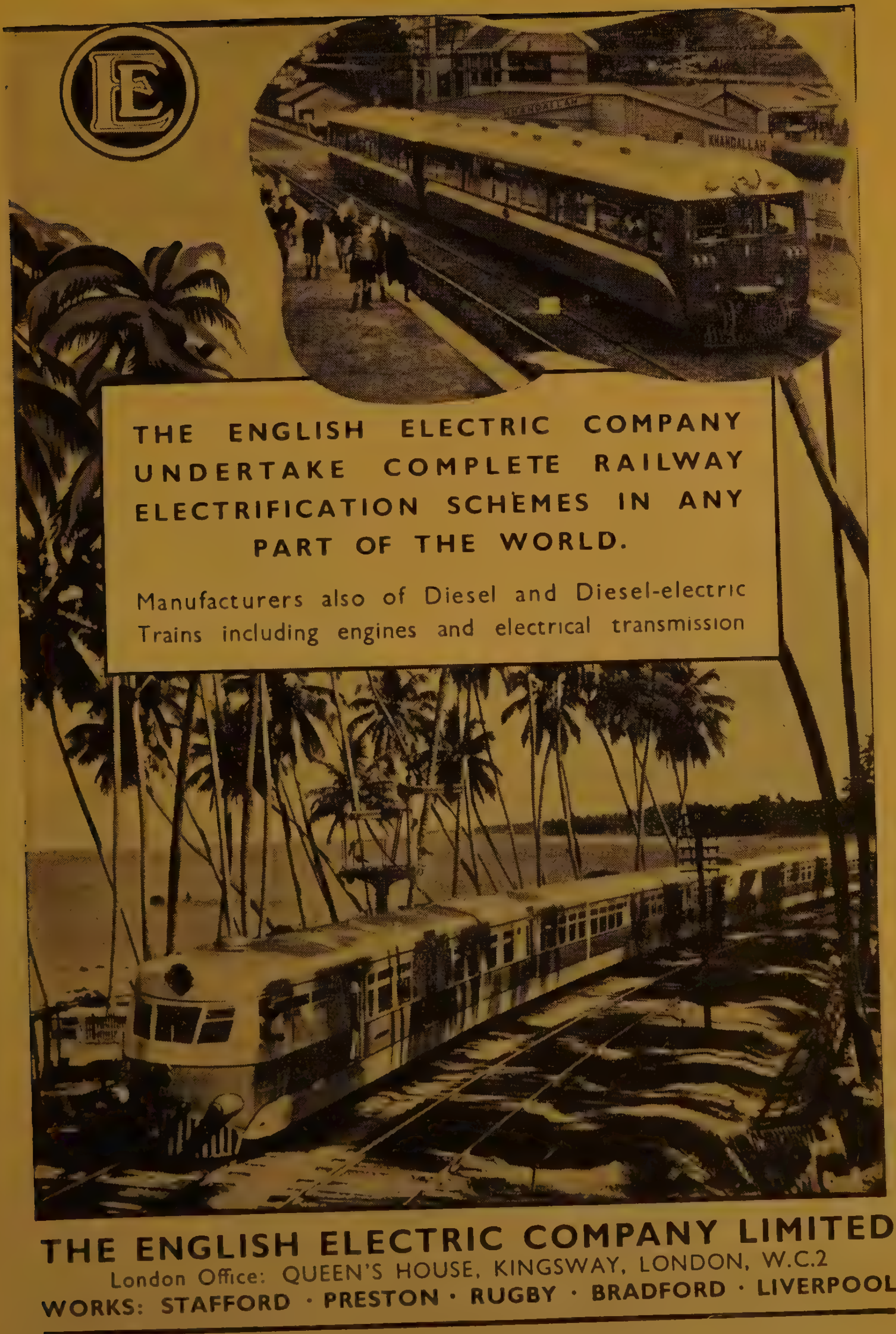
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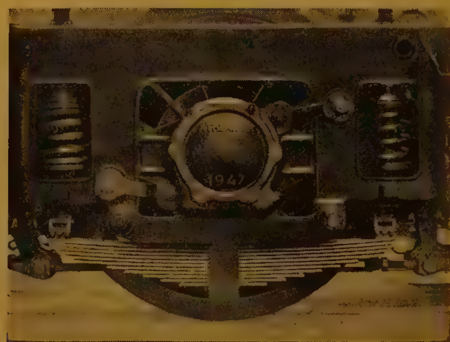

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**1948** **625 .13, 625 .142 .4 & 625 .17**

Bull. of the Int. Ry. Congr. Ass$^{on}$, No. 12, Dec., p. 727.

ROBERTSON (V. A. M.). — *a)* **Mechanisation of the maintenance and renewal of the permanent way.** *b)* **Recent improvements relating to reinforced concrete and prestressed sleepers. Results obtained.** *c)* **Recovery and strengthening of metal bridges that have reached the theoretical limit of safety.** (Question I, Enlarged Meeting of the Permanent Commission, Lisbon, 1949.) Report *(America, Great Britain, Dominions, Protectorates and Colonies, China, Egypt and India).* (24 000 words, tables & fig.)

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**1948** **621 .335**

Bull. of the Int. Ry. Congr. Ass$^{on}$, No. 12, Dec., p. 799.

DALTON (G. A.). — **Electric locomotives for fast trains (75 m.p.h. and over). Discussion of adopted and projected types. 1) Arrangement of the axles. 2) Type of axle drive : *a)* motor suspended from the nose; *b)* flexible transmission. 3) Electric motor characteristics. 4) Braking.** (Question II, Enlarged Meeting of the Permanent Commission, Lisbon, 1949). Report *(English speaking countries).* (5 400 words, tables & fig.)

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OF THE

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(ENGLISH EDITION)

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